50 HOT SUMMER RC PICKS! p.78

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VOLUME 19 ■ NUMBER 6 ■ JUNE 2004

features

WORLD EXCLUSIVE!

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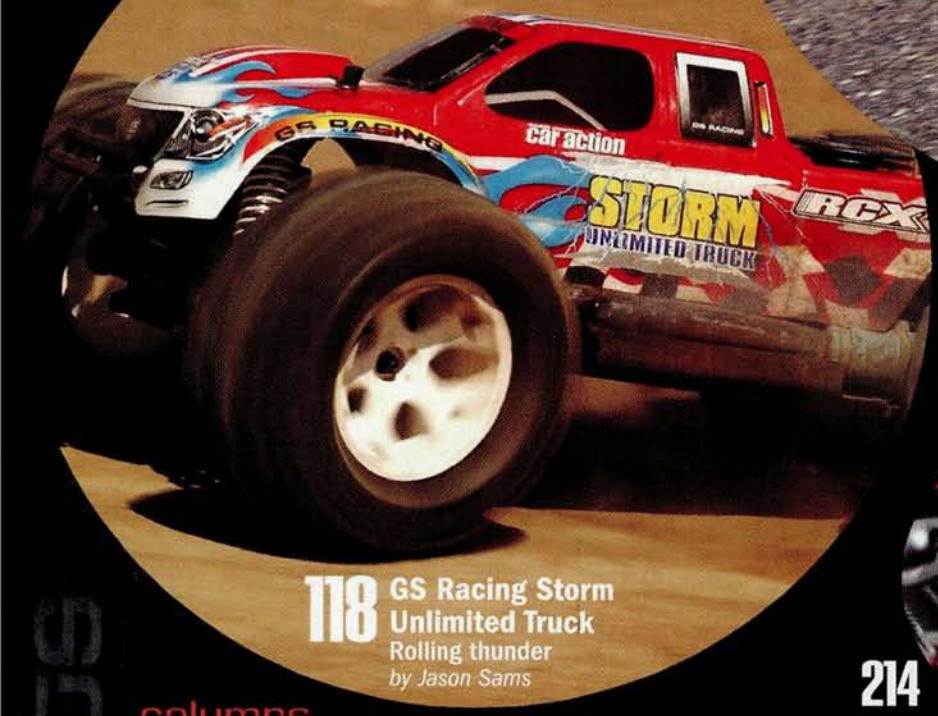

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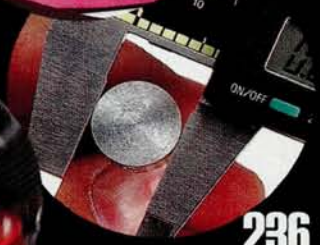

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starting line

RADIO CONTROL car action

REVOlutionary

Just in case you completely missed the cover, let me be the first to tell you that Traxxas has an all-new monster truck, and it's called "Revo." That's "Revo" as in "revolutionary," and as I'm sure you'll agree, revolutionary is certainly a good word for the latest big thing to come out of Texas. With the Revo, the monster truck scene has hit a new technological peak. The last big spike in the evolutionary chart of monster tech was the T-Maxx—the first nitro monster to combine long-arm independent suspension, a lifted chassis, 2-speed transmission, transmitter-controlled reverse and electric starting all in one package. Since then, monster tech has progressed slowly, mostly with variations on the T-Maxx formula. Some trucks such as the HPI Savage and Associated Monster GT, borrow freely from T-Maxx DNA. Others stuck with "truggy" configurations based on 1/8-scale buggies but added T-Maxx touchstones such as reversing transmissions and RTR packaging. A notable exception is Team Losi, which deserves praise for innovating new features with the LST (namely monster-specific, mega-size shocks and dual-servo steering) to go with Maxx-inspired touches like reverse capability and a 2-speed transmission.

Not that there's anything wrong with aping the T-Maxx. Given the T-Maxx's huge success, any competing brand would recognize that if its customers want Maxx-style features, they should give them Maxx-style features. But it's time for monsters to evolve, and it's only fitting that Traxxas, the company that started it all, is the company that's stepping up. The Revo is here, and it's awesome. Everyone else has an even higher standard to shoot for. We can't wait to see what comes next!

IN THIS ISSUE

HOT FOR SUMMER. Finally ... the sun is shining, the days are long, and the RC action is as hot as the weather. What are you gonna do with your lawn-mowing/car-washing/sold-some-stuff-on-Ebay money? We have 50 ways to put that paycheck to work—with the hottest gear for this season.

IS BRUSHLESS BETTER? Novak's new SS4300 "stock" motor goes head-to-head with a brushed setup in our review of the latest Super Sport brushless system. Side-by-side testing with dual test cars (one brushed, one brushless) tell the story!

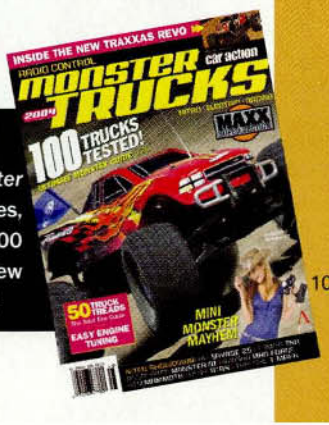
SMOKIN' RACE RIDES! One's on-road and electric; the other is off-road and nitro. What could they have in common? Both are world-class racing machines, and both are "Track Tested" in this issue. For the street, it's the HPI RS4 Pro 4. In the dirt, it's the Kyosho Inferno MP-7.5 Kanai Edition III.

Peter Vieira

Peter Vieira, Executive Editor

MONSTERS ATTACK!

It's time for the annual monster invasion, and *Radio Control Monster Trucks* is on the way! This mega-hit mag is the star of our Action Series, and it's jam-packed for 2004. In-depth how-to's, a total truck guide (100 in all!) and a mega shootout of the top nitro monster trucks are just a few highlights. Look for *Monster Trucks* to be crushing newsstands in May!



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JUST RIGHT

The TLT-1 looks great! One thing I think Tamiya really got right was the size. It's small when compared with a T-Maxx or TXT-1, but it isn't tiny. It's a real off-road truck and uses regular radio gear. I've already robbed my Traxxas Rustler's electronics and cleared off my bench. As soon as payday comes, that truck is mine! Do you know whether 2.2-inch wheels will fit? The hexes are the right size for Traxxas and HPI wheels, but are there clearance issues? [email]
RCTruckNut

They aren't 2.2 inches, but I think Wild Willy 2 wheels will be the hot setup. We slapped a set on our TLT-1, and they look perfect. We haven't tried 2.2-inch hoops yet, but that's probably too much wheel and tire for the truck's short wheelbase. Look for a "project" TLT-1 soon!
—*Pete*

XMODS WELCOME

You guys do a great job with *RC Car Action*! Since you had an article in your mag on XMods, I wondered whether you would let an XMods into "Readers' Rides" if someone sent one in? [email]
Bob Long

I don't think we'd show off a stock XMod if all we could say was "Here's Bob's RadioShack XMod. So far, his mods include opening the package and putting batteries in it." (Likewise, we generally don't run pics of stock RTRs.) But if you did some custom work to it, then sure, we'd put your XMods into "Readers' Rides." As long as the photography is OK and the car reflects the owner's personal creativity in some way, it's in.
—*Pete*

MICRO DYNO?

After seeing the March issue's article on Epic motors, I wondered whether you could do the same thing for micro motors. Just looking on TowerHobbies.com, I saw about 10 motors for 1/18-scale micros. I really liked the dyno chart you had for each motor; it tells a lot. [email]
Bill

Hmmm, that's a tough one; RC motor dynos are all designed to accept only 05 motors—that's the standard 1/10-scale motor size. But aside from size, and with the exception of Orion's Coreless motors, all micro motors operate exactly like "big" RC motors. So, anybody out there working on a dyno?
—*Pete*

FELIX FAST IN PHILIPPINES

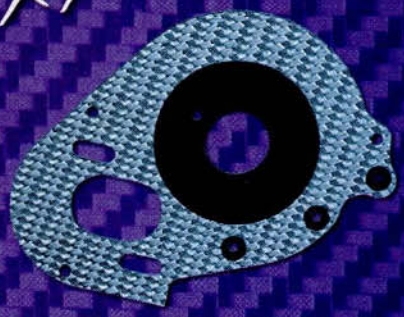
Hey guys, I just started racing RC. I drive a Yokomo SD SSG Special with a Novak Super Sport Brushless. My first race in the Philippines was in a parking lot. I finished fourth in the B-main, but now I'm just practicing for the Luzon Cup (it's like the ROAR nationals). My father bought me the car. I'm a big fan of *RC Car Action*. I've read your magazine since I was six, but even now that I'm 10, I'm still a big fan. [email]
Felix Mintu

Oh yeah? Even now that I'm 36, I'm still a big fan, too!
—*Pete*

RUNNIN' ON MT

I recently purchased an HPI Nitro MT2 and have been looking to get some aftermarket aluminum chassis parts, suspension arms, steering knuckles, hub carriers, shock mounts, etc. for it. Unfortunately, the only parts I've been able to find are for the original RS4 MT. I'm sure I'm not the only person out there who would like to buy these parts for the MT2. [email]
Dave Jenkins

HOT STUFF
XXX-BK2



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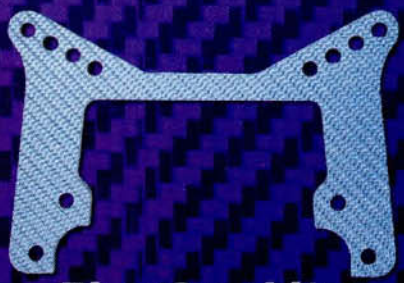

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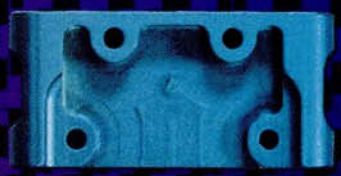

Blue Aluminum Front Bulkhead
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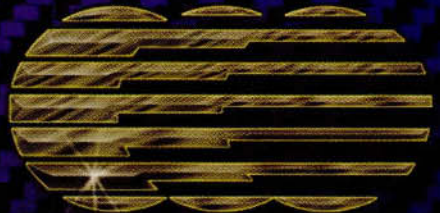

www.teamtrinity.com

readerswrite

The HPI Nitro MT2 has been revised in all areas (suspension, drive train and upper deck), and that means very few of the hop-up parts designed for the original Nitro MT will fit on the MT2. HPI plans to release many new hop-ups for the MT2 in the near future, but here are a few MT option parts from HPI that I know for sure you can bolt onto your MT2: ball diff (item no.—A958), heavy-duty ring and pinion gears (38T ring gear—A856; 13T pinion—A857), aluminum rear hub carriers (1.5 degrees toe-in—72040; 2 degrees toe-in—72041) and center universal axles (F/R—2802/2083).

Most of the original bodies, wheels and tires will fit on the MT2, and you can also bolt on many of HPI's engine accessories, including the lightweight engine mounts, machined-aluminum flywheel and various clutch bells. Additionally, the center diff mounts are the same on both trucks, which means the aluminum versions from GPM will fit, too; take a look at hobbyetc.com (GPM's U.S. distributor).
—G-Man

RC ON TV

I love *RC Car Action*. I'm new to RC and have found your articles extremely helpful. I just wanted to drop a line about RC sightings I saw recently on TV. Everyone has probably seen the Coke RC commercial from the Super Bowl, but I also noticed that a Listerine commercial shows a family with the dad working on some type of RC car at the kitchen table. Yesterday I was watched the 2003 Mothers Car Show on ESPN; it was a 4WD show, and a guy was racing around with what appeared to be a Traxxas T-Maxx or HPI Savage. Thanks again for the great mag and keep up the good work. [email]
Brian "Bubba" Watson

The RC car in the Listerine spot is on screen for about a nanosecond—good eye, Brian! I think the car is a Team Losi Triple-XS Sport, but it's difficult to tell. Every detail of a commercial shoot is planned out, so someone must be into RC at the advertising agency—and they probably read *RC Car Action*! Drop me a line, Listerine guy.
—Pete

YOU SAID IT

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"I never would have tried to do it if I wasn't into RC."

I'm 16 years old and have been into RC since I was 14. I just got my first "real" car: a 1989 Honda Civic. It's a beater. Before I could even drive it, I had to fix the brakes. When I took the car to Meineke, the guy wanted more for the brake job than I paid for the car! I decided to try and do it myself, even though I had never worked on a real car before. But I've built my own RC cars, so I figured "how different can it be?" It wasn't exactly the same, but I could tell what I was looking at and installed new front brake pads by myself. I asked the mechanic at the local service station to check that I had done it right, and he looked at it for free. I learned that I should have "turned the rotors" because they were scratched up, but the work I did was good, and the car was safe to drive. I never would have tried to do it if I wasn't into RC, and now I don't have to ride the bus to school. I thought you would like that story. [email]
James Reid

Each month, "Readers Write" sponsor Team Trinity awards the "You said it" letter writer the Reference body of his choice. This is the Wasp shell for the Kyosho Inferno MP-7.5.

You're right, I do like that story! Don't be surprised if your RC experience pops up to help you out from time to time, and not just under the hood of your Civic. Physics, math, art class ... you never know where the lessons of RC will be applied.
—Pete

readers' rides

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JACOB FEINSTEIN
HOUSTON, TX

TEAM ASSOCIATED NITRO TC3

Jacob is relatively new to RC but found that he has a knack for racing. He races his Nitro TC3 at the local track and is doing quite well. The car is stock except for an HPI Nissan Skyline body, and the first planned upgrade to the chassis is a 2-speed tranny. Keep with it, Jacob, and have fun!

IAN MURPHY
VANCOUVER, WA

HPI RTR NITRO RS4 3

This is one bad bug when out on the track. Ian modified his Nitro RS4 3 for racing with a Picco .15 engine, an Associated Factory Team blue tuned pipe, an HPI header, a 2-speed tranny, MIP shiny CVDs, Venom Racing wheels and tires, a Futaba radio system and an HPI VW Beetle body.

WILLIAM NICHOLSON
SACRAMENTO, CA

TAMIYA KING HAULER, TIGER TANK AND CUSTOM LOW-BOY TRAILER

William gets our pick for Readers' Ride of the Month for his highly detailed and customized King Hauler rig (complete with an awesome-looking, custom-made, low-boy trailer) and his Tamiya Tiger tank. This seven-foot-long creation took William roughly 14 months to complete. His goal with the low-boy trailer was to end up with something that was extremely realistic, so he machined it to look and perform just like the full-size version complete with rear steering. Great work, William!

readers' rides

JESSE SNELLEN
LOUISVILLE, KY

OFNA MONSTER PIRATE

Snow is no obstacle for Jesse's OFNA Monster Pirate, thanks to the powerful RB Concept .21 engine, 2-speed tranny and OFNA's NIK tires. He controls his all-terrain truck with a JR XR3 radio and uses Hitec high-torque servos for the throttle/brake and steering duties. A Pro-Line Ford Excursion body, painted by Jesse, found its way onto the MP to add some of his own style to his ride.

CHRIS TAYLOR
PINCKNEY, MI

TRAXXAS NITRO STAMPEDE

This Traxxas Nitro Stampede is ready for some off-roading. Chris added ball bearings to the wheels and transmission, an MIP stinger pipe, a Motor Saver air filter and aluminum skidplates that he made to protect the undercarriage. Once his stock body got thrashed, he bought a couple of new ones including this Parma '57 Chevy body that tops the Stampede nicely.

Got a New RTR? Power it up with Reedy!

Reedy Quasar AC/DC Battery Charger. Reedy's economical #610 "Quasar" peak-detecting charger plugs right into the wall (or works from any 12V power source) and adjusts from .5 amps to 6.5 amps to charge Ni-CD, Ni-MH or receiver packs.

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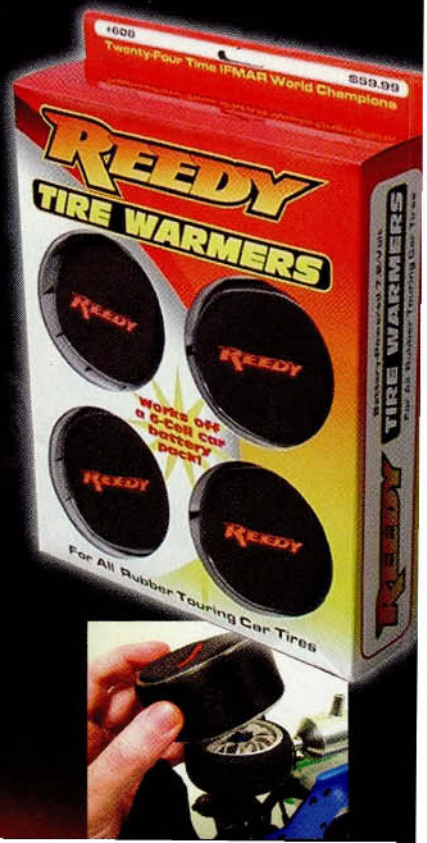

REEDY

CLINT GROLLA
SPRINGFIELD, IL

XTM X-FACTOR

Clint tells us he's a huge RC monster-truck fan and has an entire fleet of them. His XTM X-Factor is his favorite. He upgraded the chassis with most of XTM's aftermarket parts including the aluminum wheelie bar, an MIP temperature gauge and an air filter that he bought at his local automotive store. An HPI 1973 Ford Bronco body rides on top of the chassis, and Pro-Line Velocity 6 40 Series wheels mated with Big Joe tires get his truck rolling.

RON BRAY
MANITOBA, CANADA

TRAXXAS T-MAXX AND HPI NITRO RS4 3 TYPE SS

This photo isn't great, but anytime we can get the A-Team into the mag, they're going in! B.A.'s ride is a Traxxas T-Maxx with a Kyosho Mooneyes body, a Pro-Line suspension kit, a Megatech engine and aluminum shocks. Faceman's ride is an HPI RS4 3 Type SS with a Corvette body. "I pity the fool who doesn't like my cars," adds Ron.

pit tips

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ILLUSTRATIONS BY RICHARD THOMPSON

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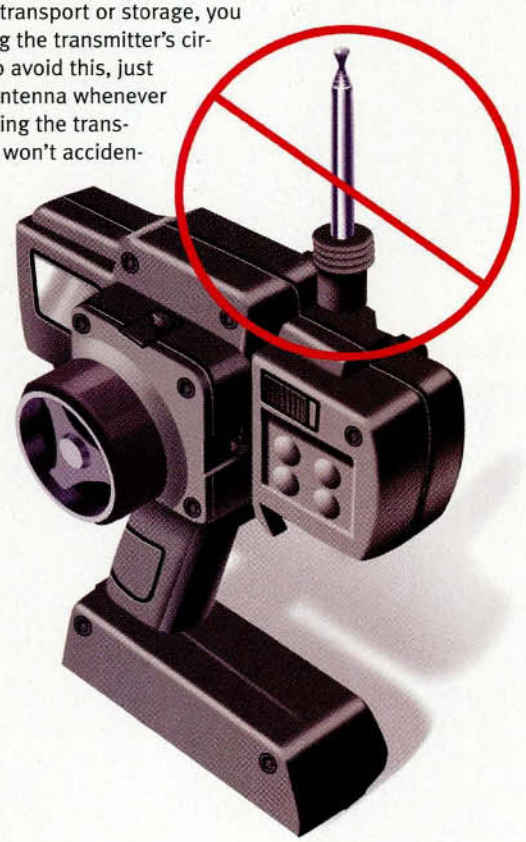
OUT WITH THAT ANTENNA

If you leave your transmitter's antenna in place during transport or storage, you risk damaging the transmitter's circuit board. To avoid this, just remove the antenna whenever you aren't using the transmitter, and it won't accidentally get pushed into the fragile circuit board.
Nick Dumfries
Bayard, IA



EASY SCUFF REMOVER

To remove marks in your car's body caused by hitting track barriers or other cars, try rubbing them with an ink eraser. These erasers are not only significantly more durable than a typical pencil eraser but also work great at getting the scuffs out of the scratches and creases in Lexan. When the mark is removed, scratches and even deeper creases will hardly be noticeable.
Misha Mlinar
Winnipeg, MB, Canada

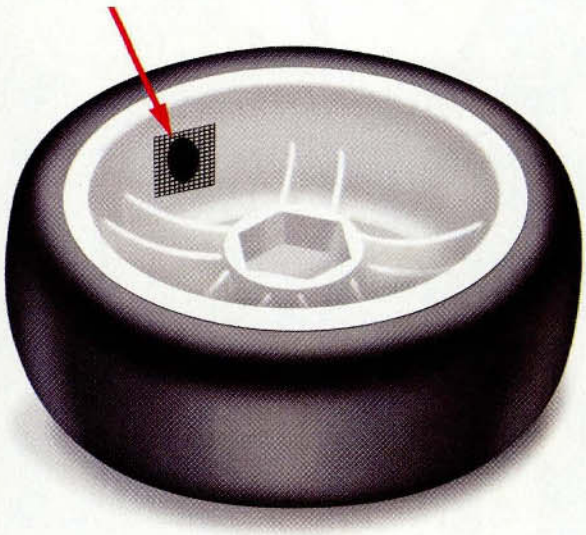
OFNA Racing TIP OF THE MONTH

COVER ME! I'M GOING IN!

To make shock coverings (usually a balloon or finger from a latex glove) easier to install, wrap your spring in electrician's tape, leaving about a 3-inch tab hanging off the bottom of it. Now, with the tape in place, the shock covering will easily slide over the spring. Once the shock covering is in the proper position, just pull the tab and the tape will unravel off the spring, and the covering will stay in place.
Brad King
Allison Park, PA

KEEPING WITH THE TIRES

Storing your foam tires in a sealed plastic bag will prevent them from drying out. After a day of racing, scrub your tires clean with a mild dish detergent and warm water. After they have dried, just place and seal them in a plastic bag. Adding a small amount traction compound to the tires will further prevent them from deteriorating during storage.
Duane Pfahler
Bellville, OH



SCREENED IN

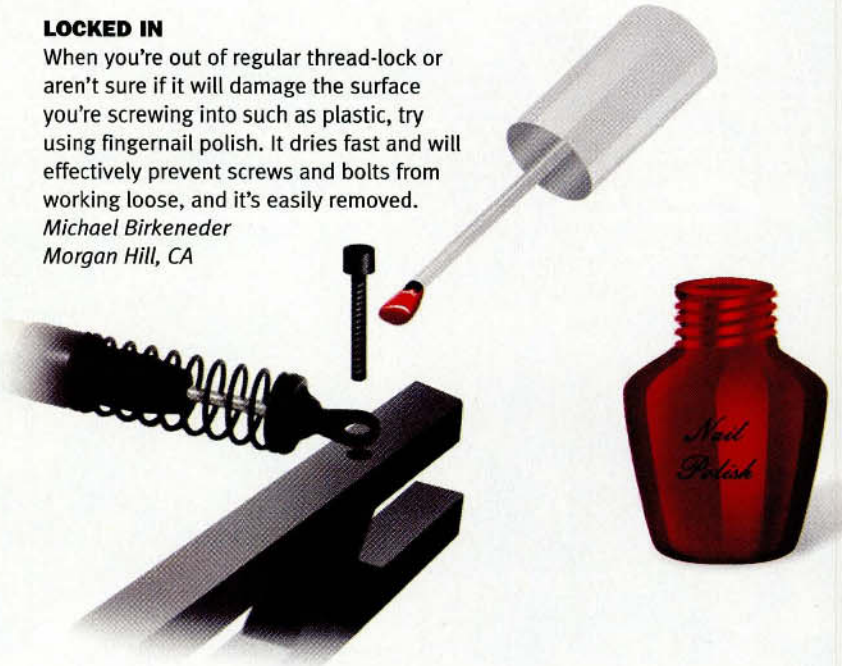
When running big breather holes in off-road tires or even small holes on touring-car tires, small rocks sometimes work their way into the rim and get trapped. To prevent this, glue a small piece of window-screen mesh over the opening. This will allow air to pass freely but will prevent debris from getting in and adding weight, or setting the wheel out of balance.

Peter Bedford
Fairfax, VA

LOCKED IN

When you're out of regular thread-lock or aren't sure if it will damage the surface you're screwing into such as plastic, try using fingernail polish. It dries fast and will effectively prevent screws and bolts from working loose, and it's easily removed.

Michael Birkeneder
Morgan Hill, CA



NATURAL ATTRACTION

An easy way to avoid losing body clips while you're in the pits or just running outside is to glue a small magnet to the inside of the body. Instead of glue, you can also use servo tape. Now every time you remove the body, just place the clips on the magnet, and you'll know where they are when you need them again.

Eric Pietryga
Beavercreek, OH

STICKY SITUATION

When assembling a ball differential, it can be difficult to place the balls in the differential gear without dropping them. The quick solution is to dab some diff grease on the tip of a hex driver. Then simply pick up each ball one at a time with the tip of the driver and place it in the gear.

Steve Hardington
Springfield, MA

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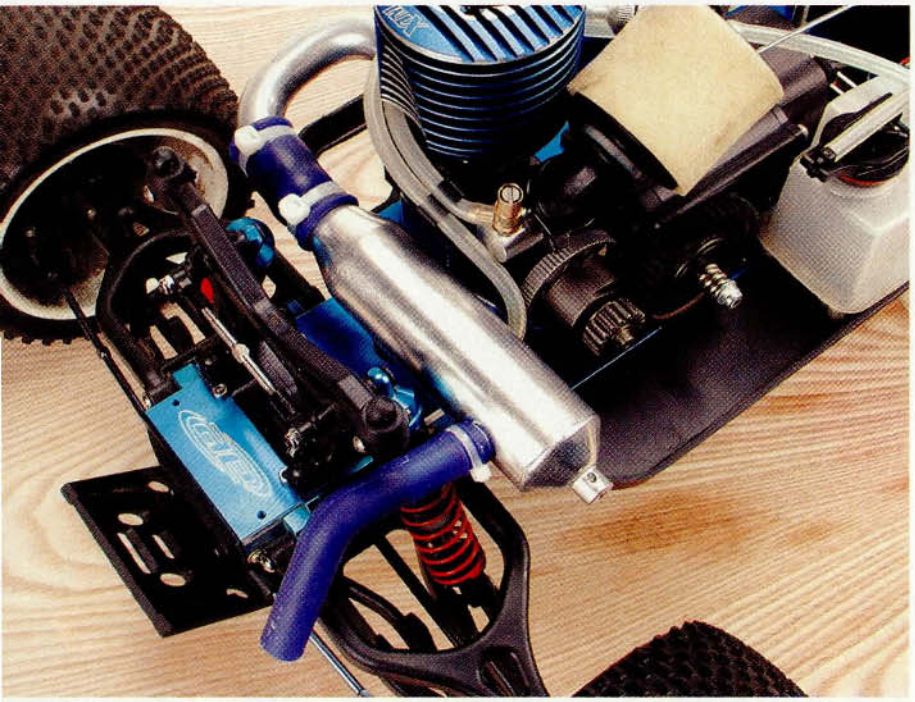
troubleshooting

YOU'VE GOT PROBLEMS? WE'VE GOT FIXES. BY GEORGE M. GONZALEZ

NEED HELP? Send your "Troubleshooting" questions and comments to troubleshooting@airage.com, or mail them to "Troubleshooting," c/o *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA.



Rotate the tuned pipe 90 degrees so that the exhaust tip exits at the back of the truck instead of through the bottom. You'll need to bend the pipe hanger to secure the pipe properly.

Q MONSTER GT STINGER RELOCATION

I've raced RC cars for years, but I recently purchased my first monster truck—a Team Associated Monster GT. This truck rocks, but I'm not crazy about the tuned-pipe location. The problem is that the silicone stinger extension always gets pinched and stalls the engine when I place the truck on my Hardcore Racing truck stand. The engine even stalled out a couple of times while racing because the silicone extension got pinched between the upper and lower rear suspension arms. I noticed that the truck has an oval slot on the left mudguard; is that hole for an optional in-line tuned pipe? If it is, where can I get one?

Michael Stefano [email]

A You can try a couple of things, Michael. The easiest remedy is to shorten the silicone exhaust extension slightly so that it doesn't get pinched when you place the truck on a stand. Simply cut approximately ½ inch off the end of the stinger extension with scissors. Or you can rotate the tuned pipe 90 degrees so that the exhaust tip exits straight out at the back of the truck, as shown in the photo, instead of down below the chassis. Team Associated offers a side-mount manifold (item no. 25405) for installing the tuned pipe in line on the chassis.

REAL PERFORMANCE PRODUCTS!

T-Maxx/2.5-Maxx Steel Top Shaft

NEW

This precision machined **hardened** steel top shaft will fit all T-Maxx. Includes oversize ball bearing. RRP 8525

T-Maxx/2.5-Maxx FORWARD ONLY Steel Gear Kit

NEW

This kit contains a 26T **hardened** steel output gear, a forward drive hub adaptor, steel spacer and Pin. RRP 8586. **Hardened** aluminum version RRP 8585.

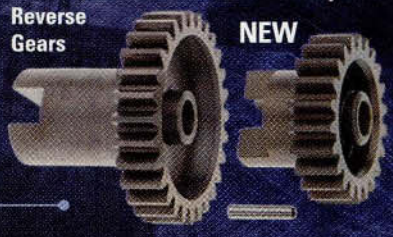
T-Maxx/2.5-Maxx Hardened Forward Primary Gear

Precision machined from solid steel and then **hardened**. RRP 8529 **Hardened** aluminum version RRP 8528.

NEW

www.robinsonracing.com

T-Maxx/2.5-Maxx Forward Primary and Reverse Gears



NEW

This kit contains a precision machined **hardened** steel primary forward gear, a **hardened** aluminum reverse gear and pin. RRP 8521

MAKE NO COMPROMISES!

T-Maxx/2.5-Maxx Lightened Spur And Double-Disc™ Slipper Kit

RRP's NEW line of Lightened Spur and Double-Disc Slipper Kits for Traxxas Nitro and T/E-Maxx/2.5-Maxx trucks are designed to improve performance and increase reliability. This combo incorporates a machined steel or Super-Tough plastic spur, a Vented Aluminum Clutch-Plate/Gear Adaptor, 2 Slipper Pads and 2 Plates to deliver the adjustability you need and the increased performance that you demand. **Complete Slipper Kits** are available in the following sizes:
RRP 8166 Slipper Kit with 66T Super-Tough plastic spur (Stock Size) for E-Maxx
RRP 8172 Slipper Kit with 72T Super-Tough plastic spur for Traxxas Nitro
RRP 8465 Slipper Kit with 65T Steel Spur for Traxxas Nitro
RRP 8472 Slipper Kit with 72T Steel Spur (Stock Size) for T-Maxx
Spurs, Clutch-Plate/Gear Adaptor and Slipper Pads also sold separately.

T/E-Maxx/2.5-Maxx Accessory Spurs

A wide range of spurs fit our Double-Disc Slipper Kits. Choose from machined Super-Tough plastic spurs in 66, 68, 70, 72, 74 and 76T sizes, RRP 82XX, or CNC machined steel spurs available in 65, 72 and 76T sizes, RRP 83XX. Small Clutch Plate/Gear Adaptor fits 65 thru 70T spurs. Large Clutch Plate/Gear Adaptor fits 72 thru 76T spurs.

T-Maxx/2.5-Maxx Primary Reverse Gear

This gear is precision machined from solid aluminum and **hardened**. Includes pin. RRP 8522

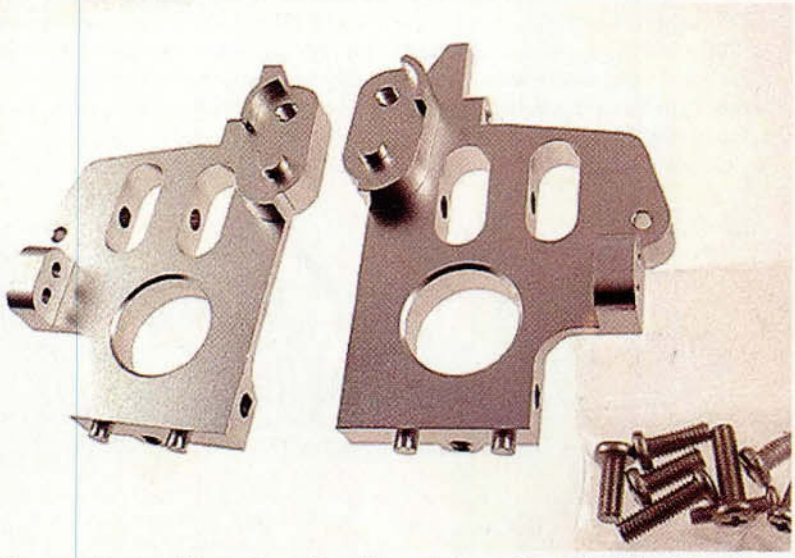
NEW

sponsored by RRP ROBINSON RACING PRODUCTS

Q FOUR-WHEEL-STEERING SAVAGE

I recently purchased aluminum rear bulkhead side plates from GPM for my HPI Savage 25. The purple-anodized pieces look great and they're super-thick, but I noticed that they have optional rear toe-link mounting holes. The side plates did not come with directions, so I don't know what the extra holes are for. I mounted the links in the bottom holes first but then noticed that the rear tires toed out considerably when I push down on the suspension. I then tried to mount the toe links in the upper holes, and the tires functioned normally without any toe-angle difference whatsoever. I left the toe links mounted in the upper holes, but I can't figure out why there are extra mounting holes that just mess up the truck's alignment. Any idea what these extra holes are for? *GUNSHY [email]*

A The bottom mounting holes provide bump-steer (the rear toe angle changes as the shocks extend and compress). As the suspension is compressed, the rear wheels toe out; and when the suspension is fully extended, the rear wheels toe in. When the truck corners, the outside rear wheel toes out during suspension compression. The opposite takes place on the inside rear wheel, which will toe in as the suspension fully extends. Using this setup may gain a little steering, but the truck will be less stable in the track's bumpy sections because the toe angle constantly changes as the suspension is compressed or extended. This setup is better suited to on-road driving and racing on relatively smooth off-road tracks.



Mounting the toe links on the optional lower holes on the GPM side plates will make the rear wheels toe out when the suspension is compressed and toe in when the suspension is fully extended.

T/E-Maxx/2.5-Maxx Steel Diff Gear Set

T/E-Maxx/2.5-Maxx differential gear set, includes: 1 beveled pinion gear, 1 beveled spur gear, 4 re-usable stainless steel phillips head screws, 1 tube Associated Black Grease, and a shim kit for spider gears with 10 .003" shims. 2 sets needed per truck. RRP 8590

T-Maxx/2.5-Maxx Aluminum High Performance Brake Kit

New, lightweight aluminum high performance brake kit, includes bigger, more aggressive brake pads and steel backing plates. One piece vented rotor minimizes side-to-side wobble. Also fits newer T-Maxx. RRP 8562 **Older style half shafts use Brake Kit RRP 8560.**

DON'T SETTLE FOR SECOND!

www.robinsonracing.com

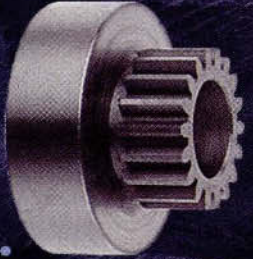
T-Maxx Vented Flywheels

Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP 8551 Blue, RRP 8550 Natural Silver **NEW 2.5-Maxx Vented Flywheel, Blue Only RRP 8552.**

T/E-Maxx/2.5-Maxx Replacement Pinion

This precision machined steel steel pinion fits RRP 8590 Diff Gear. RRP 8591

T-Maxx/2.5-Maxx Hardened Steel Clutchbells



CNC Machined from solid steel these bells are built to last. They take the 5x11 bearing (NOT included). Available in 19T, RRP 8119, 20T RRP 8120, 21T RRP 8121 and 23T RRP 8123.

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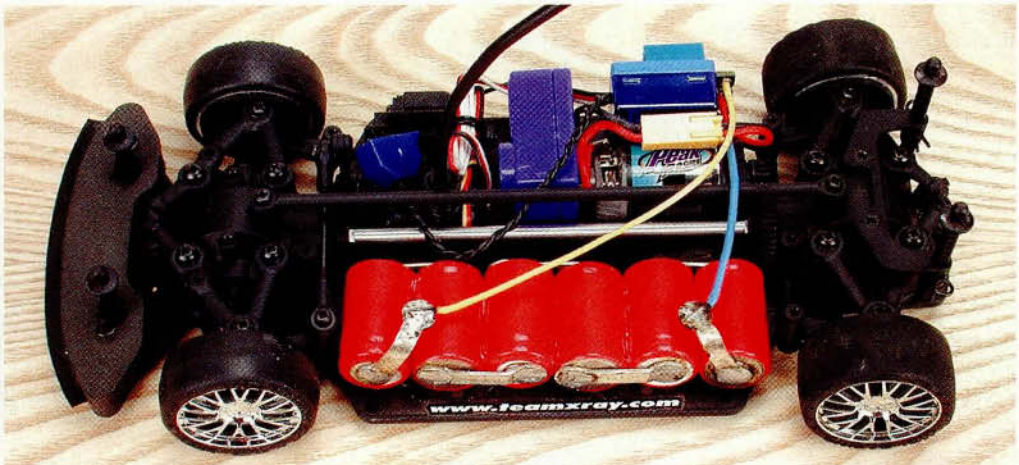
Q SIX-CELL MICRO ROCKET

I read your review of the XRAY M18 microcar in the March issue and then bought one right away. I love this car, but I want to install a 6-cell battery pack on the chassis. Unfortunately, Serpent, XRAY's U.S. distributor, doesn't have the optional 6-cell chassis for it yet. You mention in your article that "... with some Shoe-Goo and a little imagination, you can easily install 6 cells on the stock chassis." Can you explain how you did it? The car is plenty fast with 5 cells, but my buddy's 6-cell-equipped Micro RS4 kicks my butt! Please help.

Jim Seki [email]



Believe it or not, once the Shoe-Goo has dried, the battery will stay in place no matter how hard you crash the car. Mounting the 6 cells in line on the chassis' left side is easier than trying to fit all the electronics nicely on its right side.

A You'll need some Shoe-Goo and a rotary tool equipped with a sanding drum to install 6 cells in line on the left side of the chassis, as we did. First, remove the battery strap, battery-strap posts and battery holder from the chassis. (You won't need these after you've glued the battery on the chassis.) Next, remove the motor mount. To make room for the battery, you'll need to grind away approximately 2mm of material from the left side of the motor mount (the side that faces the left of the chassis). Don't grind away too much, or you'll damage the motor mount.

Last, install the battery pack. Generously apply Shoe-Goo to the battery pack, and place it flat on the left side of the chassis. You'll have approximately five minutes to properly position the battery before the glue starts to dry. Then set the car aside and let the glue dry overnight.

RC10-GT Steel Combo

Precision machined from solid steel, then hardened, this 65T spur and 15T bell combo will last and last. RRP 2365

RC10-GT Hardened Steel Idler Gear

Cut from solid steel stock, this RC10-GT gear is lightened and hardened for super quiet precision and extra long life. Black tranny grease included. RRP 2213

Associated Titanium Stealth Top Shaft

CNC Machined from solid titanium, this super hard, super light top shaft will fit any Stealth transmission. RRP 1512.

RC-10GT Hardened Steel Clutchbells

These steel Clutch Bells are CNC machined from solid steel then the teeth are machined on. This makes the part stronger with less gear "run out". Available in 14T thru 20T, 22T and 24T. RRP 22XX

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RC-10GT 32 Pitch Spurs

Precision machined from heat-resistant, super tough plastic, these spurs mesh flawlessly with our Clutchbells. Available in 63T thru 67T. RRP 2263 - RRP 2267

Hardened Diff Gear

Hard anodized, precision CNC machined aluminum diff gear. RRP 1513 RC10-GT

DON'T SETTLE FOR SECOND!

TC3 Ultra 48 Pitch Spurs

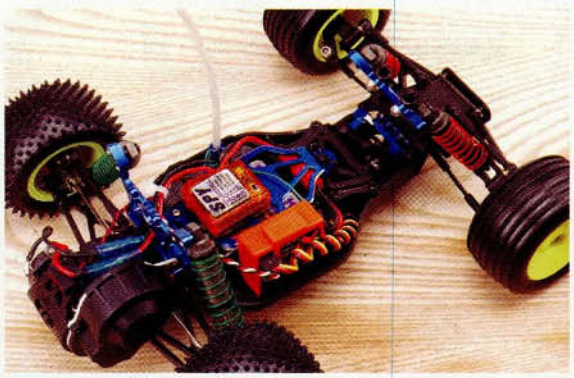
Precision machined from heat-resistant plastic, these spurs mesh flawlessly with our pinions. Available in even numbers from 70T thru 80T. RRP 1670 - RRP 1680.

sponsored by RRP ROBINSON RACING PRODUCTS

Q MINI-T OPTIONAL SERVO-SAVERS

My local hobby shop has a small off-road track where a bunch of guys race Team Losi Mini-Ts. The trucks are a blast to race, and they get superlong run times. The only problem is that there are only six available frequency crystals in the 27MHz band, so only six trucks can be raced at the same time. This causes many problems during practice time because you can never find an open frequency. I tried to install a 75MHz receiver, but the stock steering servo has a weird four-wire connector that doesn't work on standard receivers. I then thought about replacing the servo, but I can't find one with a square output shaft that's compatible with the stock servo-saver system. Do you know of a servo and a standard 75MHz receiver that will fit the truck?

Tom Pozacia [email]



Installing an aftermarket steering servo will allow you to use any 27 or 75MHz AM or FM radio system. The Mini-T shown here has a Hitec HS-55 submicroservo installed along with Novak micro electronics.

A You're in luck, Tom, because Team Losi just released Mini-T servo-savers for Hitec, Futaba, Airtronics and JR servos. The only servos that I know will fit on the chassis without modifications are the Hitec HS 50 and 55 and JR 241 and 248. Futaba and Airtronics servos will also fit, but they must be secured with servo tape because the stock servo mounts will not fit them. Installing one of these servos will allow you to use any radio system you want.

TOOLBOX

Dremel Lithium-Ion Cordless Rotary Tool

Dremel just released a new Lithium-ion-powered rotary tool that provides 40 percent more run time than the previous model. The tool features a lightweight design with improved ergonomics, a comfortable soft-rubber grip and all the usual good stuff such as variable speed control, battery meter and user-friendly chuck. The Lithium-Ion Dremel tool not only has more capacity, but it also revs 40 percent faster and holds on to 85 percent of its charge, even when it isn't used in four months. For more information, check out dremel.com.

HPI Savage 21 Nitro Steel Combo

This new 52 tooth Spur and 14 tooth Clutch Bell are CNC machined from solid steel and then hardened for unmatched performance and durability. RRP 7052

NEW

HPI Savage 21 Nitro Vented Flywheel

Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP 7000

NEW

Stealth Spurs

These precision machined spur gears are super quiet. They're available in 48P in 60T thru 96T sizes, and fit any Associated or HPI electric car or truck. RRP 1860 thru RRP 1896.

Electric Car And Truck Pinions:

48P Absolute Series Pinions

Super hard, lightened and cut with unmatched precision. Great with any spur, but with an Absolute spur, even on-off noise is gone! Available In 48P in 16T thru 28T sizes. RRP 1416 - RRP 1428.

48P / 64P SuperLite Aluminum Pinions

They're lightened, hard coated and precision cut. Available in 48P in 16T thru 28T, and 64P in 24T thru 38T. RRP 30XX (48P) and RRP 31XX (64P). Only $5.25

48P Hard Nickel Plated Steel Pinions

These precision cut gears have an extremely hard coating that makes them really last. Available in 12T thru 35T. RRP 1012 - RRP 1035

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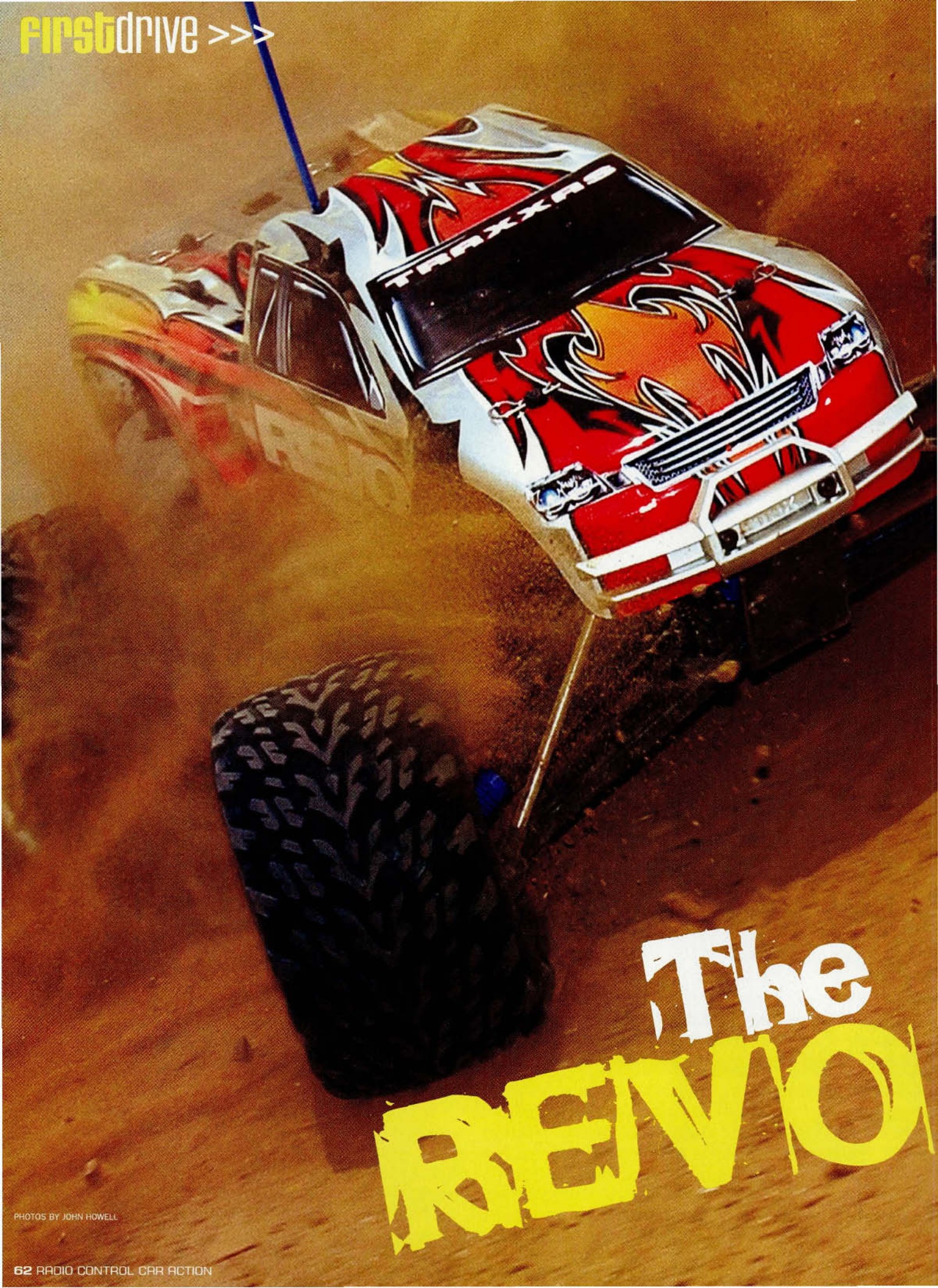
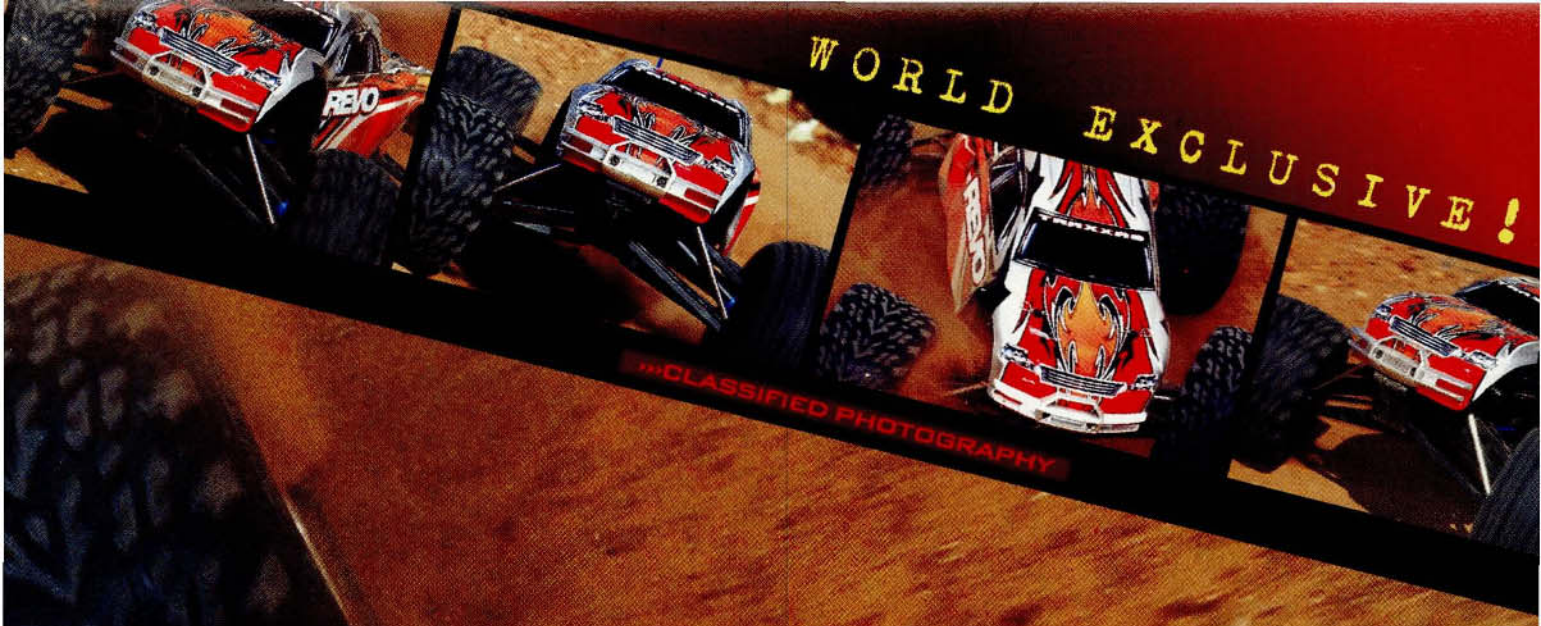


The REVO

PHOTOS BY JOHN HOWELL



by the RC Car Action team

The Traxxas REVO smashes the monster mold

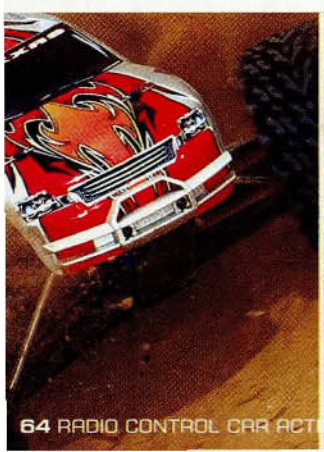
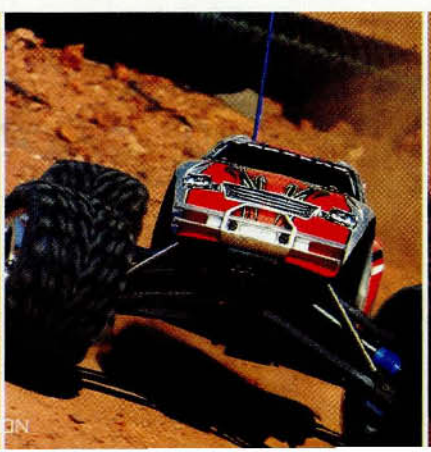
Forget everything you know about nitro monster trucks. Everything we've come to expect from a monster, every convention, every perception of what makes a monster, was shattered the moment Traxxas showed us the Revo. Is that short for revolutionary? You bet it is. It only takes one glance to confirm the Revo is a truck like no other. Where you would expect to find 8 shocks, there are only pushrods. Where you expect to find a flat plate for a chassis, there is an intricately formed aluminum monocoque. And then the details sink in: the shocks are inboard and actuated by cantilevers; dual steering servos simultaneously push and pull the steering bellcrank; the axles are massive and sealed by flexible boots ... the list is endless. Perhaps we should start by listing the items carried over from the T-Maxx. Let's see; there's ... nothing. The Revo is all-new and not just new for Traxxas. No truck has ever had the features the Revo has. And here's the best part: it works.

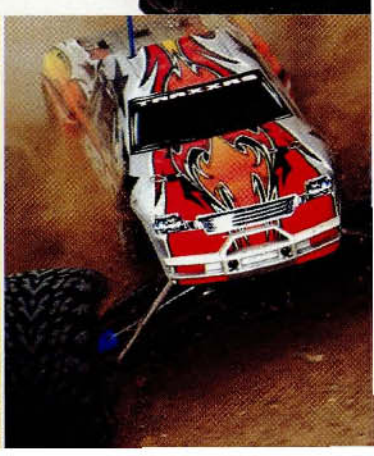
LUTION has begun!

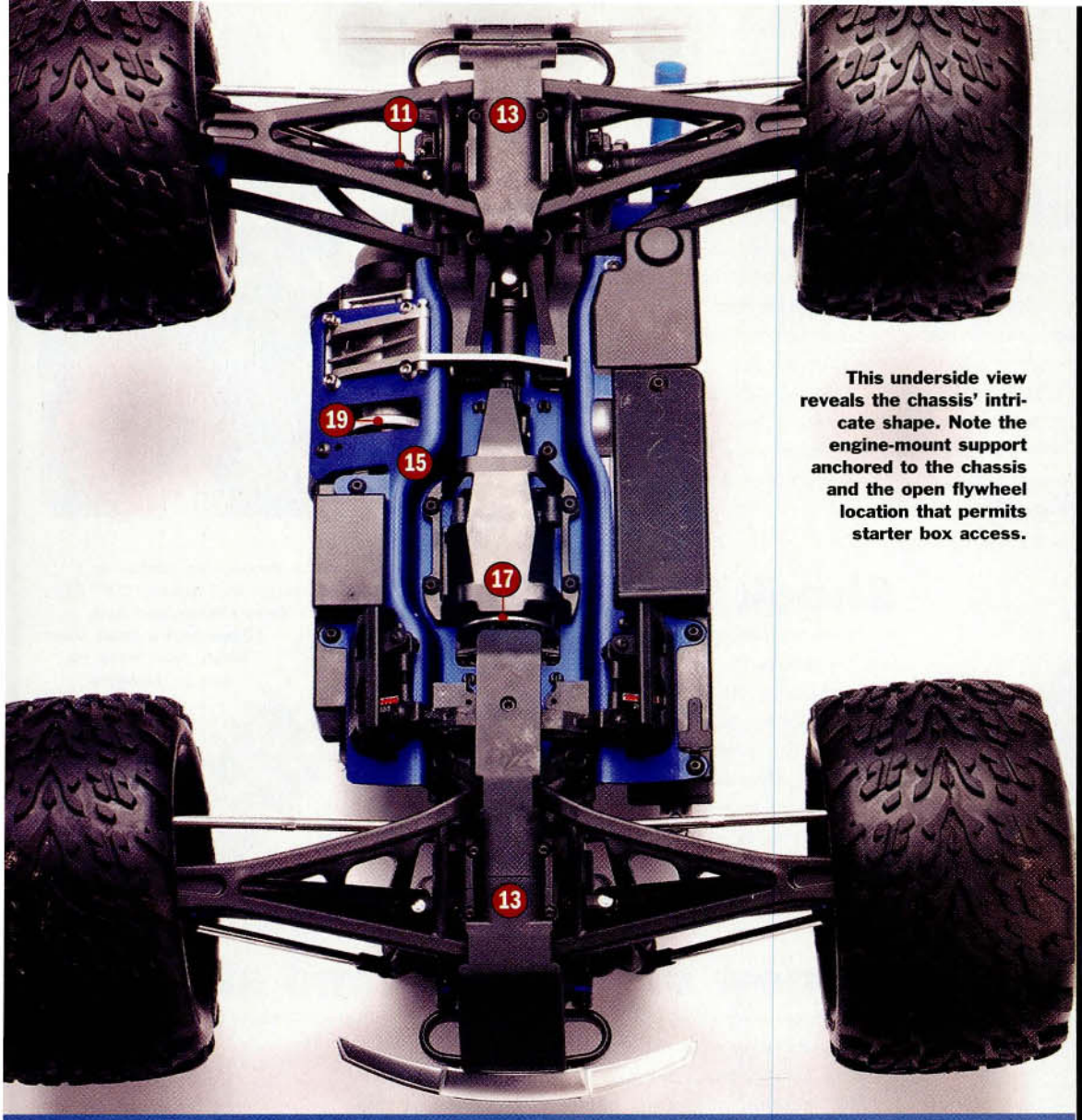
DETAILS

1. TRX 2.5 R racing engine with machined head
2. EZ-Start 2 electric starting system
3. Aluminum multichamber tuned pipe with oval cross-section
4. Roll hoop/carrying handle
5. Rocker-actuated inboard shocks with threaded-aluminum bodies
6. Rubber-sealed pivot-ball suspension
7. Low-profile tires with captured beads
8. Dual steering servos
9. Clutchless, constant-engagement reversing 2-speed transmission
10. Optidrive Electronic Shift Module (ESM)
11. Rubber-sealed 18mm drive axles with true curvilinear splines
12. High-thermal-capacity Torque Control slipper clutch
13. Rubber-sealed, silicone-filled Traxxas Limited Slip (TLS) differentials
14. 125cc fuel tank with fill handle
15. 3mm 6061-aluminum monocoque-type chassis
16. Sealed radio boxes with integrated charging jack
17. Disc brake with heat-dissipating cast aluminum calipers and vented 40mm steel rotor
18. Fuel pinch for easy engine shutdown
19. Starter-box-accessible flywheel
20. High-strength body mounts and bumpers

Every millimeter of chassis space has a purpose. Note that the engine is canted in toward the center of the chassis to help lower the truck's CG.





This underside view reveals the chassis' intricate shape. Note the engine-mount support anchored to the chassis and the open flywheel location that permits starter box access.

SPECS

DIMENSIONS

OVERALL LENGTH 19.1 in. (486mm)

WHEELBASE 16.25 in. (414mm)

MAX GROUND CLEARANCE 4 in. (101mm

WEIGHT (RTR) 150.4 oz. (4,262g)

TRANSMISSION

CLUTCH TYPE 2-shoe centrifugal

2-SPEED MECHANISM Pawl/Pin

1ST GEAR RATIO 23.85 final

2ND GEAR RATIO 16.54 final

SLIPPER CLUTCH Adjustable, semi-metall pads, alloy pressure plates

REVERSE MECHANISM Transmitter actuat with electronic control and safety lockout

BRAKE Single disc, 40mm steel rotor, all calipers with semi-metallic pads

SUSPENSION

TYPE Sealed pivot ball with inboard push rod/rocker-actuated shocks

SHOCKS Threaded-aluminum body with nutted pistons, volume-compensating bladder and progressive-rate bump stops

ADJUSTMENTS Roll center, camber, front caster, front and rear toe, sag, preload, progressive rate, total travel, ride height

ENGINE AND ACCESSORIES

ENGINE Traxxas TRX 2.5 R w/slide carb

PIPE Dual-chamber aluminum

STARTER EZ-Start 2 electric onboard starting system

HEADER Tubular aluminum

AIR FILTER High-volume foam, flow-tuned

FUEL TANK 125cc with internal filter

BODY, WHEELS AND TIRES

BODY Traxxas Revo, factory-finished, decaled and mounted

TIRES Talon 5.75x3 in. (146x76mm)

WHEELS Revo chrome, 3.2 in. (81mm one-piece plastic with groove-type bead

INSERTS Foam

ELECTRONICS

RADIO Traxxas TQ3 3-channel

STEERING SERVOS (2) 2055 high-torque

THROTTLE SERVO (1) 2055 high torque

SHIFT SERVO (1) Traxxas mini

RECEIVER PACK Traxxas 5-cell, 1100mAh Ni

INCLUDED ACCESSORIES

- AC/DC receiver pack charger (with AC power supply)
- Integrated 5-cell, 1100mAh NiMH receiver pack
- 48-page full-color instruction manual
- Tuning and setup DVD
- Adjustment tools: metric hex wrenches aluminum wrenches (5mm, 8mm) and specialty tools
- Extra air filter elements
- Long-Travel rocker set and springs
- Suspension-adjustment hardware

Price (estimated) $500

PRO VOLTS

With four servos on board, the Revo would undoubtedly chew through 4 alkalines in a hurry. So the Revo doesn't use them. Instead of the expected 4-cell battery holder, the Revo includes a genuine 5-cell, 1100mAh receiver pack. That's a nice plus, but a NiMH receiver pack requires a specialized charger. No worries: the Revo comes with one. The slim charger can juice up the receiver pack in about an hour, and it isn't a no-frills unit. It has peak-detection circuitry, can run on DC power for field use and AC power at home, and it's compatible with Ni-Cd receiver packs as well as the included NiMH pack.

FEATOR

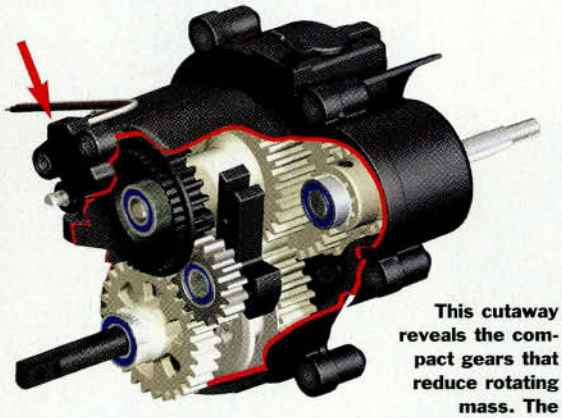
Powerful pipe

Traxxas spent a lot of time tweaking the Revo's PowerTuned exhaust system to extract maximum power from the TRX 2.5 R engine, which now wears a larger, machined-aluminum, blue-anodized PowerTune head. The oval-ized, multichamber aluminum pipe and tubular manifold have been shaped with the help of dyno testing and aren't just there to look cool—so think twice before you decide to bolt something else on!

The fuel tank is designed for easy body-on access through the side of the body, and its low profile helps maintain consistent fuel pressure while extra loops of fuel tubing prevent the engine from starving if you park the Revo on its lid.

The fuel tank's cap is tilted for easy filling through the side of the body.

The oval-section, dual-chamber pipe is custom tuned to deliver maximum power.

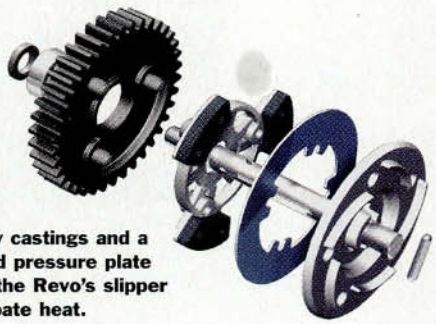


This cutaway reveals the compact gears that reduce rotating mass. The Optidrive sensor is arrowed.

Lightweight transmission

Traxxas was the first to offer a centrifugally shifted 2-speed transmission with a servo-operated reverse system, and this capability returns with the Revo. But the shift into reverse is now microprocessor controlled (see the "Optidrive explained" sidebar), and the Revo gearbox doesn't use an internal clutch, so power delivery is smooth and constant. It's also a smaller, lighter transmission, with fewer moving parts and less rotating mass, which all adds up to "faster." Racers take note: you can even alter the ratio of second gear (by installing optional parts), so you can have a close-ratio setup for short tracks or a larger jump for big-track speed. Out of the box, the Revo splits the "close" and "wide" second-gear ratios.

A slipper clutch is standard, and it's a totally new design that's built for severe duty. Dubbed "Torque Control," the clutch uses three individual, semi-metallic pads and a steel slipper plate. An aluminum casting holds the slipper pads and is finned to dissipate heat. According to Traxxas, even loose settings will not roast the spur gear.



Beefy castings and a finned pressure plate help the Revo's slipper dissipate heat.

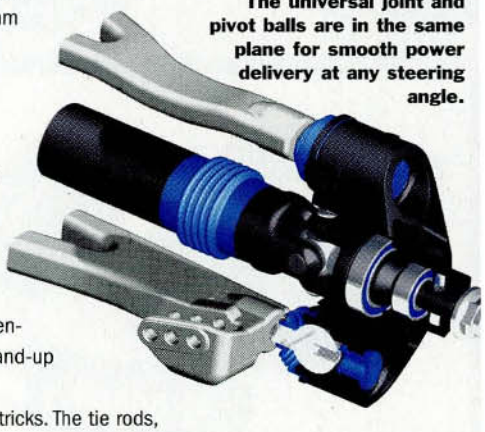
Shock tech

The shocks are similar in length to Traxxas' "XX" Big Bore shocks and have 13mm bores–equal to or larger than most 1/8 buggy dampers.

The Revo's dampers are hiding a lot of high tech. First, the obvious: the aluminum bodies are threaded, so you can adjust preload without clips. But if you look at the spring perches, you'll spot a subtle feature: bump stops. Not just O-rings or mere bumpers, these conical stops provide a progressive compression rate that prevents harsh bottoming. There's more. The shafts are heavy-duty 3.5mm jobs, and the pistons are nutted, so they won't wobble on the shafts or pop an E-clip under load. Bladders are used for volume compensation, but since they aren't pinched by the shock caps, there's no chance you'll twist or tear the bladder when you tighten the cap.

All-new suspension and steering

Inboard shocks are the Revo's most obvious suspension feature. Pushrods transfer bump loads to the shocks via rocker arms, and the rockers' leverage ratios allow the shocks to provide major arm travel—120mm with the "long-travel" rockers. The installed rockers deliver 90mm of travel, and the optional 120mm parts are included.



The universal joint and pivot balls are in the same plane for smooth power delivery at any steering angle.

The inboard shocks have a number of benefits. True progressive action from the spring and damper is a huge plus, says Traxxas, and moving the shocks away from the arms eliminates the chance of the shock shafts being bent in a crash. The location also shields the shocks from dirt and debris, and because they're laid down, the Revo's center of gravity is much lower than it would be with stand-up shocks.

The Revo's pivot-ball suspension has a few new tricks. The tie rods, pushrods, rear toe rods and steering-servo linkages are captured, so they can't pop off. Rubber bellows now seal the pivots, so dirt can't contaminate the joints. You can even grease them without fear of attracting dirt. The inboard hinge pins are hardened steel and captured (no E-clips), and there are two upper hinge-pin positions available for roll-center changes.

The steering system is all new. A pair of high-torque servos swings the Revo's wheels via a bearing-supported monocrank under the chassis. There's a servo-saver built into the crank, and its tension is adjusted by placing shims under the spring.

Note that the pushrods are mounted far from the rocker pivot, while the shocks are mounted much closer. That's how the Revo delivers major suspension travel without using overly long shocks.

Monocoque-style chassis

More ground clearance and a lower center of gravity? Is that possible? It is when the chassis is wrapped tightly around the drive train and the electronic gear hangs off its lowered sides. The Revo's impressively intricate chassis starts out as flat, 3mm 6061 aluminum sheet that's formed into a monocoque structure that is strong, light and rigid. A plastic roll hoop protects the engine and serves as a carrying handle, and a pair of sealed radio boxes holds the receiver and Optidrive "brain" on the right side and the throttle/brake and shifting servos on the left. Underneath the chassis, plastic guards and skidplates protect the dual-steering servos and shaft-drive system. Socket-head hardware is used throughout, and all the screws are recessed or held away from the bottom of the chassis so they won't get packed with dirt.

With its radio boxes, engine, and tranny removed, it's much easier to see how truly revolutionary the Revo chassis is. There's nothing else like it.

Sealed drive train

The drive train's most visible feature is its drive shafts. They're still plastic telescoping units with universal joints, but that's where similarities to the T-Maxx end. First, the new shafts are huge—18mm in diameter, to be precise. And instead of a few, square-edge splines, the Revo's shafts use a true curvilinear spline (the tops of the splines and the "valleys" between them are radiused). This lets the sliders telescope more efficiently, and twisting is a non-issue. They're big-block ready, and thanks to their rubber seals, the shafts are dirtproof. "Lifetime durability," says Traxxas.

Rubber-sealed bearings hold the shafts. The bearing on the inboard side of the carrier actually fits over the universal-joint's yoke, so the flex point of the joint is in line with pivot balls' axis. This lets the suspension and drive train operate more efficiently and eliminates axle deflection when steering.

The differentials are new as well. The Traxxas Limited Slip (TLS) diffs can be adjusted by filling them with different weights of silicone fluid. X-rings seal the output shafts, and a controlled-crush silicone seal fits between the ring gear and case. Sheer tightness isn't required to seal the system, the ring/pinion mesh doesn't change with the tightness of the diff-case screws, and diff access is quick and easy.

Check out the seals on the pivot balls and axle–dirt ain't gettin' in there.

Here's a look at the diff. The case splits "front to back" for better gear and bearing alignment, and you can see the seals in blue. The bearing on the ring-gear side of the diff is larger to better handle thrust loads.

Disc brake

Don't look for a cheesy plastic rotor or stamped caliper plates here. The Revo's caliper is made of molded alloy and looks like a stopper you'd see behind the spokes of a Porsche. The pads are semimetallic for fade resistance and grabbing power, and they squeeze a 40mm drilled and vented rotor. The brake spring's rate and length is tuned for the Revo, so braking power is progressive and easily modulated. A thumbwheel makes it easy set maximum brake power.

Does that caliper look "real" or what? There's stopping power to spare.

Low-profile tires

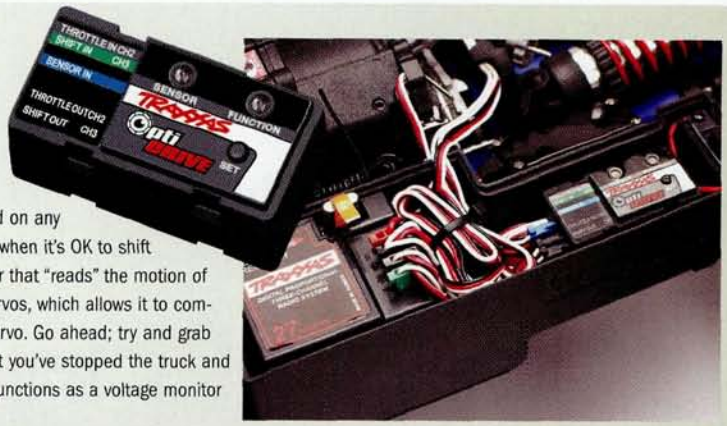
The Revo's new tires and wheels are a unique size, but they will fit the T-Maxx, since they are mounted on 14mm hexes. The wheels are larger in diameter and wider than T-Maxx wheels, so the tires can run lower-profile sidewalls with less sidewall protrusion, and the new tread pattern looks much more performance-oriented than the tractor-tire status quo. The tire's beads are plugged into a deep channel in the rim, so centrifugal force can't pull the tire off. The tires are glued to the wheels, of course, but the glue doesn't have to resist the centrifugal forces on the tire—the rim takes that load.

No goofy tractor treads here. The Revo wears high-performance rubber.

firstdrive >>>

revo

Optidrive explained



There's an extra bit of electronic gear stowed on the Revo that you won't find on any other truck Optidrive. This computer-controlled system "tells" the shift servo when it's OK to shift into reverse or back into forward. The core of the system is an optical sensor that "reads" the motion of the transmission gears. The Optidrive is tapped into the throttle and shift servos, which allows it to compare throttle position and transmission speed before it activates the shift servo. Go ahead; try and grab reverse while humming down a straightaway. Until the Optidrive registers that you've stopped the truck and laid off the throttle, it won't shift. Smart, but it gets smarter: Optidrive also functions as a voltage monitor and lets you know when the receiver pack runs dangerously low. Nice.

INTERVIEW

>>> BRENT BYERS REVO ENGINEER

When it comes to engineering, Traxxas doesn't fool around. There are eight full-time, degree-packing, hardcore engineers on the staff, and they all contributed to the Revo. Brent Byers is a familiar face among the brain trust; you might remember our interview with him from our "First Drive" with the T-Maxx 2.5, way back in the November 2002 issue. Once again, we sat down with Brent for his comments on the latest Traxxas monster machine.

RC CAR ACTION: When did the Revo design process begin? Was it right after the T-Maxx 2.5 was finished?

BRENT BYERS: Well, the learning process began with the T-Maxx. You develop something so far, and then it needs to be released. But as soon as it's out there and you get more and more time with it, you learn what could have done better, what works and what doesn't. So, for the past 3 years, we took notes about what would be different if it was to be done again. In that respect, it's an ongoing learning thing. But in earnest, the Revo began a year and a half ago.

RCCA: When the T-Maxx 2.5 came out with its longer suspension arms, did you know then that you wanted to do something more down the road, or did you feel it was an effective solution and were happy to leave it at that?

BB: It was kind of a Band-Aid, but it worked reasonably well for that truck. With the higher speeds the T-Maxx could reach because of the TRX 2.5 engine, it obviously needed to be more stable than it was with the original arm configuration.

RCCA: Along with the suspension, was there a short-list of features you wanted the Revo to have or problems that you wanted to solve?

BB: The electronic transmission control was something that had been conceived for T-Maxx, but it wasn't cost- or time-effective to get it done at that point. So we knew the second-generation, 4x4, reverse-capable monster truck would have an electronic transmission control.

RCCA: The Optidrive system prevents damage to the transmission caused by shifting from forward to reverse (or vice versa) while the Revo is at speed. Are there any other benefits?

BB: Yes. By using an electronic rather than mechanical system, all the transmission parts can now be injection molded; that makes them lighter and a lot less costly to manufacture, so the savings can be passed on to the customer. In addition, the transmission has about a 40-percent reduction in parts count because of the electronics, so the assembly cost is reduced, it's easier to service, and there's no issue of clunky clutch engagement off idle; it's all positive engagement now.

RCCA: The Revo's monocoque-like chassis represents a huge commitment to a new concept and some very expensive tooling. Was the Revo ever on a plate chassis, or did you know from the beginning that you had to come up with something completely different?

BB: We knew from the beginning that a flat plate wasn't going to work. A lot of creative ideas were developed, including a multipiece, forged structure. Basically, the formed-sheet, monocoque-style chassis won out for manufacturing and design reasons. It also seemed to be the best performance-wise, all things considered.

RCCA: Were inboard shocks always part of the program, or did you realize that they were the only way to make the suspension do what you wanted?

BB: The inboard shocks were part of the picture from the beginning. We weren't sure it would be a viable solution until we did some real testing, but we knew it was radical and knew it had to work at least as well as what it was replacing. If it didn't work, then there was no way we could go with it. Testing revealed that it worked better, so the inboard shocks became a permanent part of the Revo design.

RCCA: Now that the Revo is here, how happy are you with the finished machine?

BB: I am very pleased with the Revo. It is one thing to dream about a bunch of radical design elements, but it's quite another to turn those ideas into an effective and reliable platform that can excite even the most jaded "conventional" monster truck enthusiast. Bottom line: It has got to work! I believe we are offering something that is truly better for every monster enthusiast. It can be dangerous to move away from a well accepted and proven formula–just look at Coke and New Coke. We are aware that if we offer something radically different, it must truly be better. Monster truck designs were beginning to converge. We departed from the established formula with the objectives of increased long term durability, serviceability, versatility, ease of use and overall performance. I believe we have achieved those objectives with the Revo.

WE DRIVE IT!

>>>ROUGH TERRAIN

Our first tests went down at an ATV and motorcycle off-road park where there was a combination of flowing trails and lunar-like rough stuff. We drove two versions of the truck—one with standard cantilevers that produce over 90mm of travel, and one with the optional cantilevers, which give over 120mm of travel. The long-travel Revo runs through deep ruts with its suspension pumping vigorously. Deep ruts made by earth-moving equipment were easily traversed, and craggy stretches of churned, hardened mud weren't a problem. The 90mm truck also took these rough sections very well, but long travel is definitely the hot setup, and switching to the 120mm rockers requires only a few minutes' worth of wrenching. The long-travel truck's body and chassis stayed more straight and level thanks to the increase in suspension travel. Slamming through deep ruts gave the slipper clutch a good workout and undoubtedly spared the transmission gears from a lot of strain that the T-Maxx's "must-be-tight" slipper would have sent straight to the gearbox.

>>>RACETRACK HANDLING

Take the Revo wherever you want, but to really see it in its element, put it on a track. Johnny Cool Guy Raceway in Euless, TX, was our test site, and the track's hard-packed red clay surface gave us an excellent opportunity to see the full capabilities of this new machine (you can check out the track at johnnycoolguy.com). The stock suspension setup provides a neutral, balanced steering response. It doesn't push radically like most monster trucks', and it doesn't oversteer. Without question, the Revo corners more crisply than the T-Maxx. The two servos get the wheels turning with more authority, and the soft-compound tires and new, larger wheels get more bite than ever. The silicone-filled diffs give better drive coming out of the corners, and even if the inside wheel lifts, the diff resists unloading and keeps power flowing to the wheels that are hooked up.

>>>SPEED AND ACCELERATION

The Revo's acceleration is clearly stronger and smoother than the T-Maxx's. Rear anti-squat has been added to the suspension geometry mix. The Revo still squats a little when you're hard on the gas, but not nearly as much as most other rigs in the monster truck ranks. The refined 2.5 engine and exhaust system and new, low-rotating-mass transmission get this truck moving more quickly than the T-Maxx, which is still tough to beat in acceleration and top speed—even for big-block trucks. When there's enough traction, the acceleration is stout enough to flip the truck onto its lid. The high-revving small-block is clearly powerful, but it's a smooth power that results in great performance without making the truck difficult to control. Smooth bottom-end performance transitions seamlessly into screaming-high speeds, and this gives the Revo the "range" that pushed the T-Maxx to the front of the performance pack; the Revo and the TRX 2.5 R just do it a little better. We didn't have radar gear available to confirm its top speed, but we estimate that the Revo won't have any trouble meeting or exceeding the T-Maxx's 45mph top speed.

>>>STOPPING POWER

The Revo's braking performance is exceptional. The large steel disc and bonded semi-metallic pads did an excellent job of delivering strong, smooth, consistent stopping power. The brake-pad material is similar to the stuff used in full-size cars, so it's well suited to a long exposure to heat and friction. Having the pads mounted on aluminum backing plates helps to cool the pads and keep braking more consistent.

>>>BACK THAT THING UP!

Worth noting is that the Revo has reverse. The electronically monitored transmission now waits for the truck to come almost to a stop before it executes the shift. Throttle is limited to 70 percent when the truck is running in reverse. This new technology makes the many clunky, overweight gears used in the T-Maxx unnecessary. Most notable is the absence of bucking and jerking when slowly accelerating from a stop. The new transmission delivers smooth, seamless acceleration, in forward and reverse.

>>>TOUGH TRUCK

The Revo endured many landings on its lid after we missed backflips at the ATV park, it tumbled the length of the straightaway and drilled the pipes at Johnny Cool Guys, and it survived general abuse with all of its parts intact. That isn't a promise that you won't break anything, but the Revo sure seems tough.

SOURCES

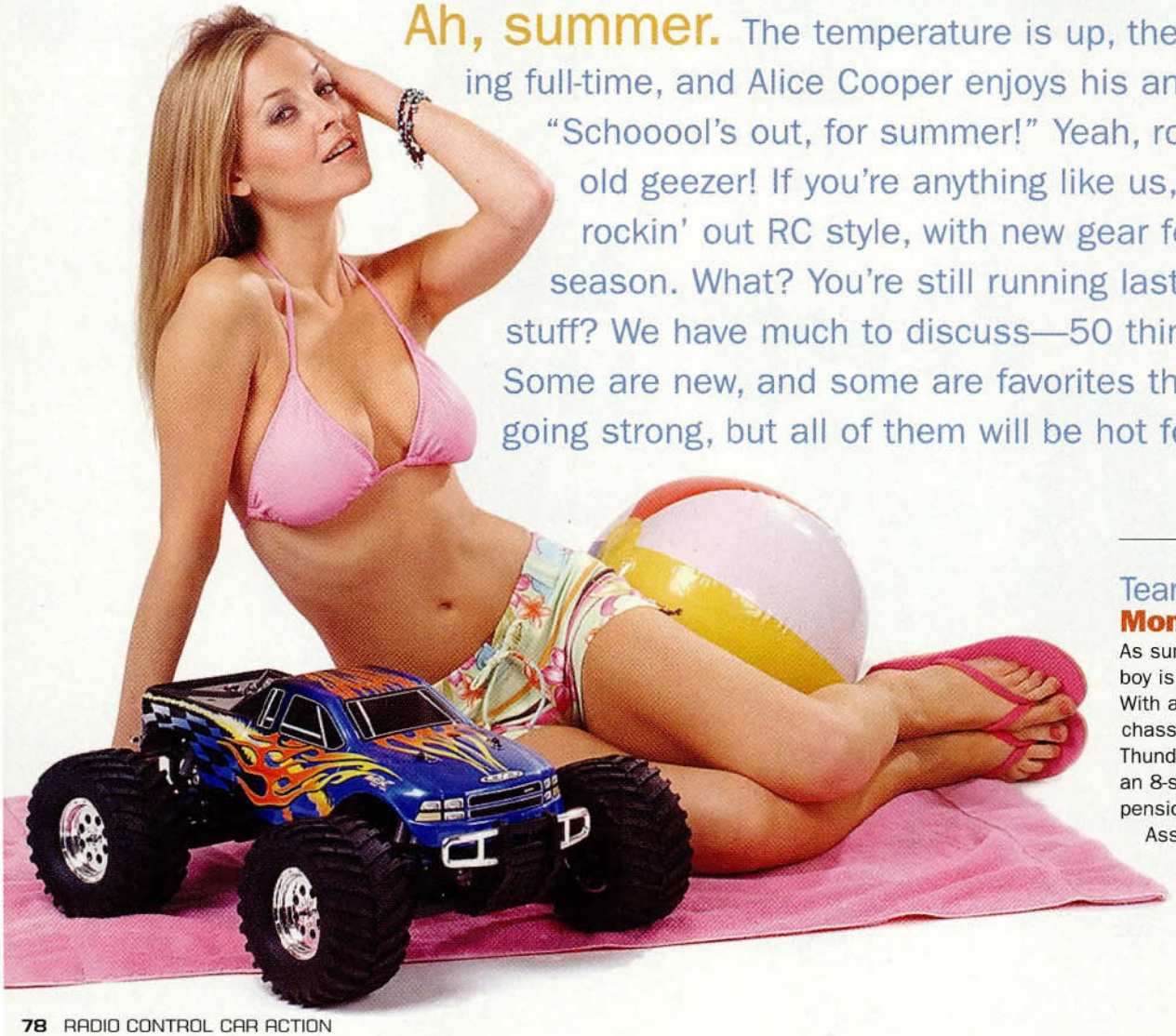
TRAXXAS CORP. (888) 872-9972; traxxas.com.

HOT FOR SU

50 ways to feel the heat

by the *RC Car Action* team

Ah, summer. The temperature is up, the sun is shining full-time, and Alice Cooper enjoys his annual airplay: "Schooool's out, for summer!" Yeah, rock on, you old geezer! If you're anything like us, you'll be rockin' out RC style, with new gear for the new season. What? You're still running last year's stuff? We have much to discuss—50 things, in fact. Some are new, and some are favorites that are still going strong, but all of them will be hot for summer!



Team Associated
Monster GT
As summer hits, this bad boy is still selling strong. With a bombproof extruded chassis, a shaft starting, Thunder Tiger .21 engine, an 8-shock pivot-ball suspension and it's an Associated—what's not to like?
Item no.—20500, $500

MMR!

Kyosho **Inferno MP-7.5 Kanai Edition III**

Kyosho's ultimate off-roader has IFMAR World Championships to its name and includes upgrades hand-picked by world-champ driver and Inferno designer Yuichi Kanai. Read the "Track Test" in this issue!

31273B, $750

Trinity **UltraBird 19-turn**

The handout motor for the 2004 Snowbird Nationals is now available to the public. The machine-wound, 19-turn UltraBird's armature is epoxy balanced and tagged, so there's no need to worry that someone could drill larger balancing holes to gain an unfair advantage. The motor features adjustable timing, FB-6 magnets and standup brushes. It meets all ARCOR and ROAR 19-modified-class specs.

TRI14004, $58

Futaba **CDR-5000 & Thermo Stand**

Futaba's easy-to-use CDR-5000 is packed with features: programmable auto cutoff, delta peaking, capacity (mAh) and temperature-charging modes, five built-in fans ... it's loaded. The CDR can even charge 36 cells at once—that's six 6-cell packs, math whiz. The optional Thermo Stand checks each cell's temperature, mAh rating and voltage level. Knowledge is power.

CDR-5000, $450

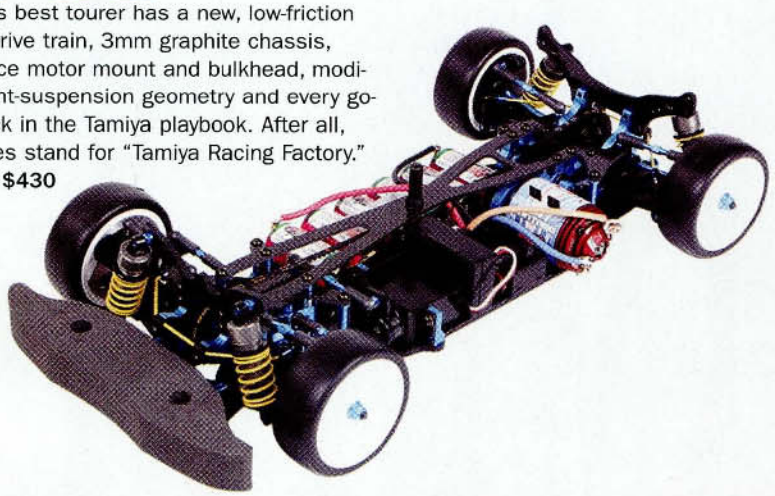
Traxxas **REVO**

Whoa! Look at the ... and check out ... wow ... oooh ... wow. We're speechless. It's sensory overload. So much innovation, so much trickness, so obviously gonna be incredible on the track—there's no doubt that the Revo is the most exciting monster ever. See it in all its groundbreaking glory on page 62.

Too new for item no. and price; estimated $500

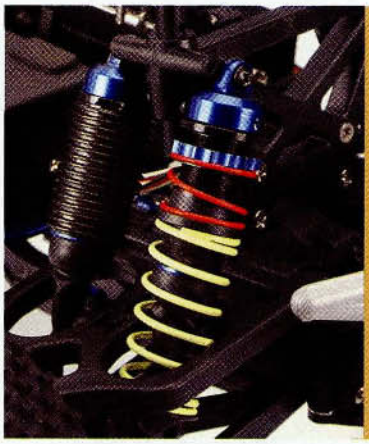
Tamiya **TRF415**

Tamiya's best tourer has a new, low-friction 2-belt drive train, 3mm graphite chassis, one-piece motor mount and bulkhead, modified front-suspension geometry and every go-fast trick in the Tamiya playbook. After all, TRF does stand for "Tamiya Racing Factory."
58320, $430



Futaba **3PM-F & 3PM-FS**

Futaba's new 3PM series delivers High Response System (HRS) fast-frame-rate technology, 10-model memory, ABS braking, digital trims, adjustable steering speed and more. If you opt for the "S" model, you'll get crystal-free frequency synthesizing to boot!
90520FM27, $190

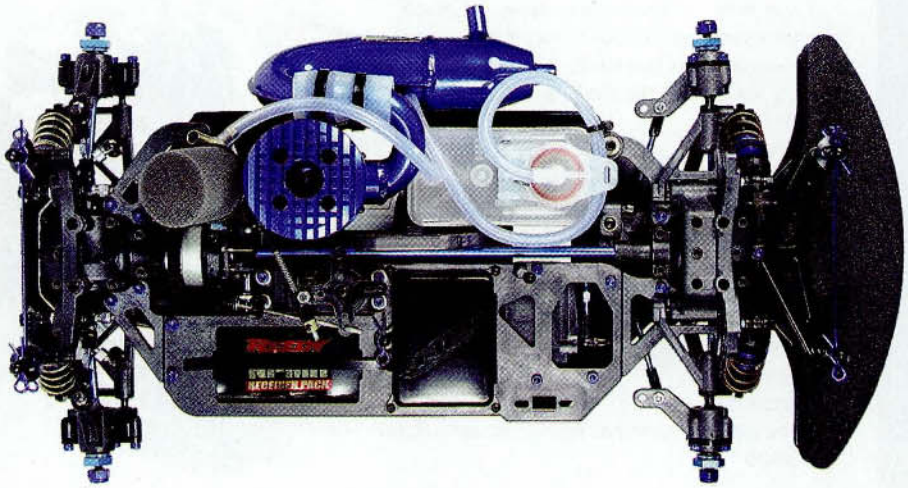


Pro-Line Racing **PowerStroke shock system**

If Pro-Line can get it out by summer, the PowerStroke setup will indeed be hot! It's a custom design for 8-shock trucks. According to Pro-Line, the system is less susceptible to bottoming out on hard impacts, but it still maintains light damping at extended travel thanks to position-sensitive valving (code for "full-scale racing technology").
6025-00, $135

Team Orion **Steenari & Hara Pro Edition Revolution V2 motors**

These Pro Edition Revolution V2 motors are done up in each driver's color scheme and have all the standard Revolution features: cylindrical, angled brushes, an aluminum endbell, direct-solder brushes, built-in capacitors and anti-vibe springs.
Item nos. vary with wind, $70



Team Associated **Factory Team Nitro TC3**

This full-blown racer comes with all the options used by Team Associated's factory racers. With dual lower pivot balls in the rear arms, vertical ball studs, front and rear blade-type swaybars, revised gearing, a more adjustable 2-speed clutch, dual-chamber pipe, it's loaded. Too many features to list, you might say.
2033, $420

Sirio **S21BK Kanai**

According to Sirio, the Yuichi Kanai-tuned S21BK pumps out 2.5hp at 42,000rpm! The 5-port mill is a perfect match for Kyosho's Inferno MP-7.5 Kanai III buggy, but you can install it any buggy—or in a moped; it's all good.

S21BK, $310

Tamiya **TNX**

Tamiya developed the TNX's FS-18RS engine with help from O.S., and it's a screamer. A 2-needle slide carb, race-inspired crank and aggressive porting suggest competitive intentions, and the truck's forward-only drive train backs that up. Plus, the TNX is pounds lighter than the Terra Crusher! The monster wars have only just begun.

43508, $470

Novak **Smart Tray Digital Equalizing Discharger**

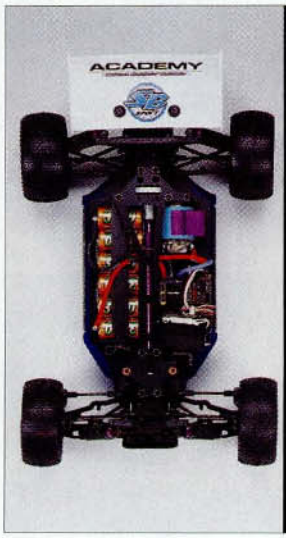
Novak's new Smart Tray Digital Equalizing Discharger is a microprocessor-controlled battery-discharger that you can program. An individual LED at each cell tells you when the cell is completely discharged, and the unit automatically stops dumping at the cutoff you've programmed into it. Trick.

4500, $90

OFNA **Ultra-Comp**

The Ultra Series lives on with this new Ultra-Comp version. The 1/8-scale buggy comes with the powerful Force .26 engine that accepts the Power Start system. It has the same 145cc fuel tank as the Violator, full pillow-ball suspension, front universals and a laydown steering servo. At $300, that's a lot of buggy for the money!

34308, $300



MRC/Academy **SB Sport**

For something with "Sport" in its name, this thing is loaded: fiberglass chassis, lots of purple-anodized aluminum, ball diffs and a serious racing profile. MRC might have the sleeper hit of the off-road racing scene this summer!

1594, $200

Trinity **T-Spec**

Here's the idea: if you put a bunch of guys on the track with identical cars, motors and batteries and write a few rules to keep mod-ifications in check, they can concentrate on winning with skill instead of spending for speed. And all the better if the car is a 4WD, shaft-driven sedan that's fully adjustable as well as full-on affordable.

TRI90003 (kit only), $140; (kit w/motor, battery & body), $180

HOT FOR SUMMER

Hitec/ Multiplex **Profi 707**

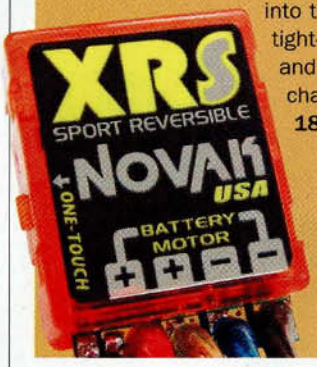
Multiplex's Profi 707 weighs just 21 ounces, can switch between AM and FM operation, has a claimed 50-percent faster reaction time than other car radios and features a 12-model memory. And heads up, tank guys: it has 7 channels.
M25242, $375

Venom Racing **Mini Giant**

Mini-trucks are hot, and there's a new player on the scene—the 4WD, RTR Mini Giant. To get going, all you have to do is add AA batteries. The Mini Giant has solid front and rear axles, a three-link suspension, 70mm tires and a Lexan body. Big-truck stuff in a much smaller package!
VEN0005, $130

Novak **XRS**

Novak Electronics' pint-size reversible ESC has features that are typically found in higher-priced speed controls. Among others, "One-Touch Set-Up," a low 15-turn motor limit and the more effective Smart Braking II are included. Its size is another draw for RC enthusiasts who need a small unit to fit into today's tight-fittin' car and truck chassis.
1830, $55



Team Orion **Advantage Charging System**

Team Orion's new charging system allows the user to specify different charge rates to be used throughout the charge cycle. Delta-peak, capacity and temperature cutoff modes are available, as well as motor run-in capability. You can use the USB port to monitor and store data on your PC, and there's even a stopwatch and a lap counter!
ORI30115, $210

Kyosho **Twin Force**

The Mad Force goes electric! Kyosho's new solid-axle, dual-motor monster is wired for two 6-cell packs to give you awesome, wheelie-popping action. If you like power, you'll like the Twin Force. Most of the parts from the nitro Mad Force have been carried over to this new truck, so there's no shortage of cool aftermarket parts.
KYOC0103, $280

Horizon Hobby **SportWerks Mayhem**

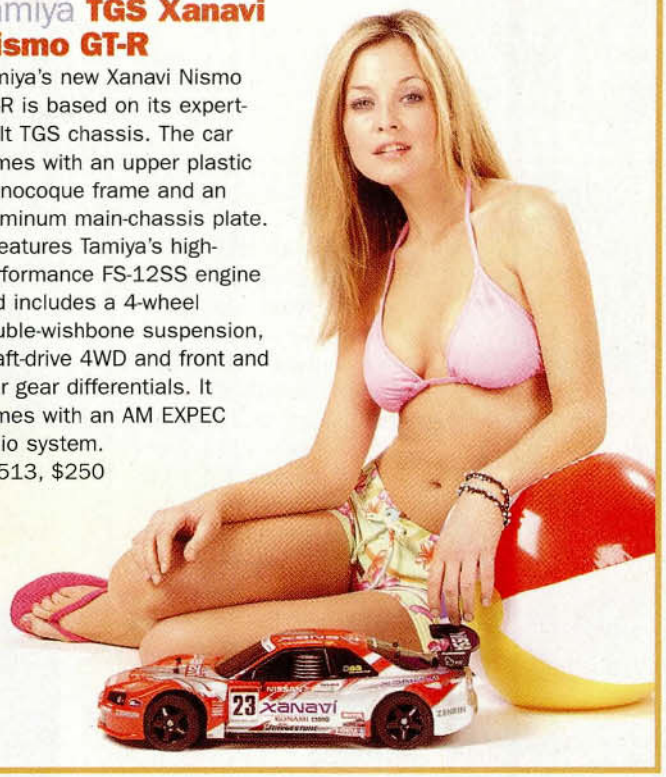
The Mayhem is the first machine in Horizon's SportWerks line, and it comes in two flavors: Sport (RTR with radio gear) and Pro ARR (as in "almost RTR"—you supply the radio.) Hard-anodized shocks and chassis, laydown steering servo, fully adjustable suspension and lots of billet parts are standard. Maybe they should change the name to "ProWerks."
SWK1100 (Pro ARR), $390; SWK1150 (ARR w/engine), $530; SWK1200 (Sport RTR), $550

Team Losi **LST**

Team Losi blew us away with its new LST (Losi Super Truck). In case you haven't heard, the monster comes with a .26 7-port big-block, race-tuned aluminum exhaust system, portable rotary starter and four massive aluminum shocks. It has a 2-speed automatic gearbox with manual Hi/Lo drive range for four forward speeds, all-metal transmission gears, a 3-channel JR radio with button-controlled reverse, two steering servos with servo-savers and an oversize fuel tank with a built-in primer.
LOSB0010, $600

Tamiya **TGS Xanavi Nismo GT-R**

Tamiya's new Xanavi Nismo GT-R is based on its expert-built TGS chassis. The car comes with an upper plastic monocoque frame and an aluminum main-chassis plate. It features Tamiya's high-performance FS-12SS engine and includes a 4-wheel double-wishbone suspension, shaft-drive 4WD and front and rear gear differentials. It comes with an AM EXPEC radio system.
43513, $250



HPI Racing **Jeep Wrangler Rubicon & Hemi 'Cuda**

These Jeep Wrangler Rubicon and a 1970 Hemi 'Cuda shells are drop-on fits for the Savage and Traxxas T-Maxx. Photorealistic headlights, grill, taillights, official logos, window frames, door handles and more are all on the precut decal sheets, and HPI even includes a huge supercharger blower for the 'Cuda.
7182 (Jeep Wrangler Rubicon), 27; 7181 (Hemi 'Cuda), $27

XTM Racing **X-Factor 2**

XTM's newly updated X-Factor 2 comes with a new, longer chassis, silicone-filled diffs, threaded aluminum shocks, metal-gear steering servo, new gearing for improved top speed, softer suspension to improve stability, heavy-duty ball ends, new Y-spoke wheels, telescoping drive shafts, captured drive axles and full ball bearings. The truck also comes with a Hitec Aggressor radio and XTM's powerhouse 24.7 engine.
145642, $380

HOT FOR SUMMER

Yokomo **MR-4TC drifters**

Yokomo has four drift cars to choose from, each with authentic, fully-detailed drifter bodywork. Choose from a Nissan 180SX, Mazda RX7, Toyota Trueno AE86 and a Nissan S15 Silvia. Super-hard tires with patented "drift rings" make it easy to break the rear end loose, and since the cars use the MR-4TC SD chassis, you can easily go racing when you aren't getting sideways! **Item nos. vary with body style, $280**

Tamiya **Super Clod Buster**

Despite being released more than 17 years ago, the Clod Buster remains one of Tamiya's most popular monster trucks. In answer to requests from Clod Buster fans, Tamiya has upgraded the twin-motor 4WD Clod by giving it a brand-new look. Just as hot for this summer as it was for the summer of '88!
58321, $210

GS Racing **Storm Unlimited Truck**

This big-block, buggy-based machine won the first big race the GS guys entered it in, and it's hitting shops now—fully RTR! Check out the full review in this issue.
GS-2005, $490

Epic Motorsports **Monster Metal cells**

Epic has teamed with GP to produce its own custom, handpicked Monster Metal cell that, according to Epic, "boasts the highest voltage and biggest capacity in RC." The new Monster Metal is 3300mAh plus, and it has been tweaked for maximum performance.
EP0015, $65

Protoform **MG ZS**

Protoform has replicated one of the most popular British Touring Car Championships vehicles: the MG ZS sedan. The MG body is best suited to tracks with long straightaways and high-speed corners. High-speed wing, mounting hardware, sticker sheet, window masks and overspray film are included!
1468-00 (200mm), $23; 1467-00 (190mm), $23

Tamiya **TLT-1 Rock Buster**

The first release in Tamiya's new 1/18-scale Little Gear Series, the TLT-1 (Tamiya Little Truck) uses standard-size electronics, including a 540 motor. The 4WD truck sports a four-link cantilever suspension and can be set up for 4-wheel steering.
47201, $145

HOT FOR SUMMER

Tamiya **Wild Willy 2000**

The Wild Willy 2 has long been one of our favorites, and Tamiya recently re-released it in an all-chrome limited edition. You still get the same Wild Willy 2 chassis (featuring its gearbox neatly secured in a monocoque frame) and body, but as you can see, it's a whole lot shinier!

49337, $150

KO Propo **Helios EX-10**

The Helios has a much more intuitive interface than any previous KO radio thanks to its unique jog dial that allows you to quickly scroll through the programming menus. You can store settings for up to nine models, or use the PC interface to save and upload as many as you like.

KOP80066 (75MHz), $350

HPI **Nitro MT2**

The Savage isn't HPI's only 4-wheeler. The MT2 matches 4WD with stadium style—not to mention the hot T-15 engine with dual-needle carb and Roto Start, redesigned extra-travel suspension and a bold new body. Hot for summer, for sure.

1041, $360

Killer B

Especially for the Associated B4

Reference

TRINITY

TRI39300

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Competition Electronics **Pit Bull X3**

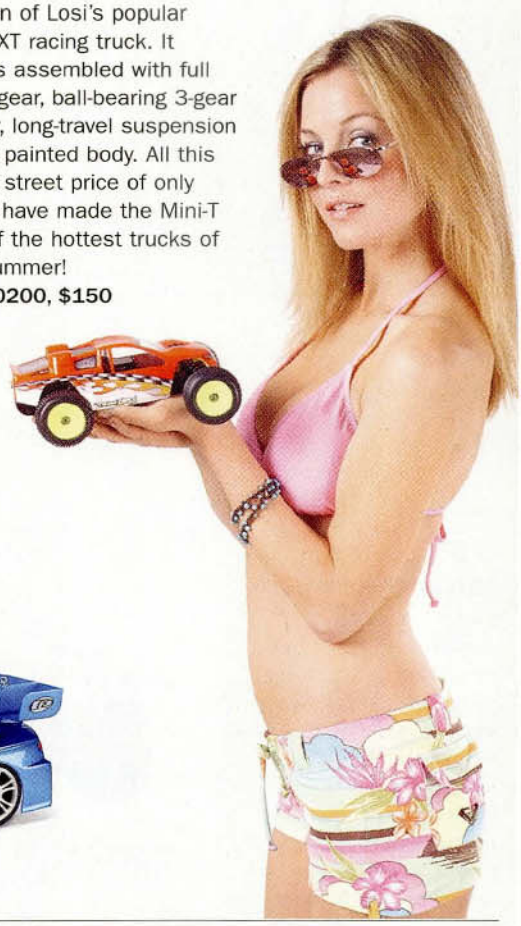
The X3 allows you to use a multiple-rate charge mode to customize your charge profile and get maximum performance from your packs. In addition, it has five nameable setups to charge all kinds of NiMH and Ni-Cd packs; a backlit display monitors mAh, volts and amps; it has been preprogrammed for use with common battery types; and comes with a peak-detection linear charge mode that can be set between .15 and 7 amps (for 4- to 7-cell packs). Plus way too many more features to list here!

CEI-4310, $135

Team Losi **Mini-T**

The Mini-T is a 1/18-scale version of Losi's popular Triple-XT racing truck. It comes assembled with full radio gear, ball-bearing 3-gear tranny, long-travel suspension and a painted body. All this and a street price of only $150 have made the Mini-T one of the hottest trucks of the summer!

LOSB0200, $150

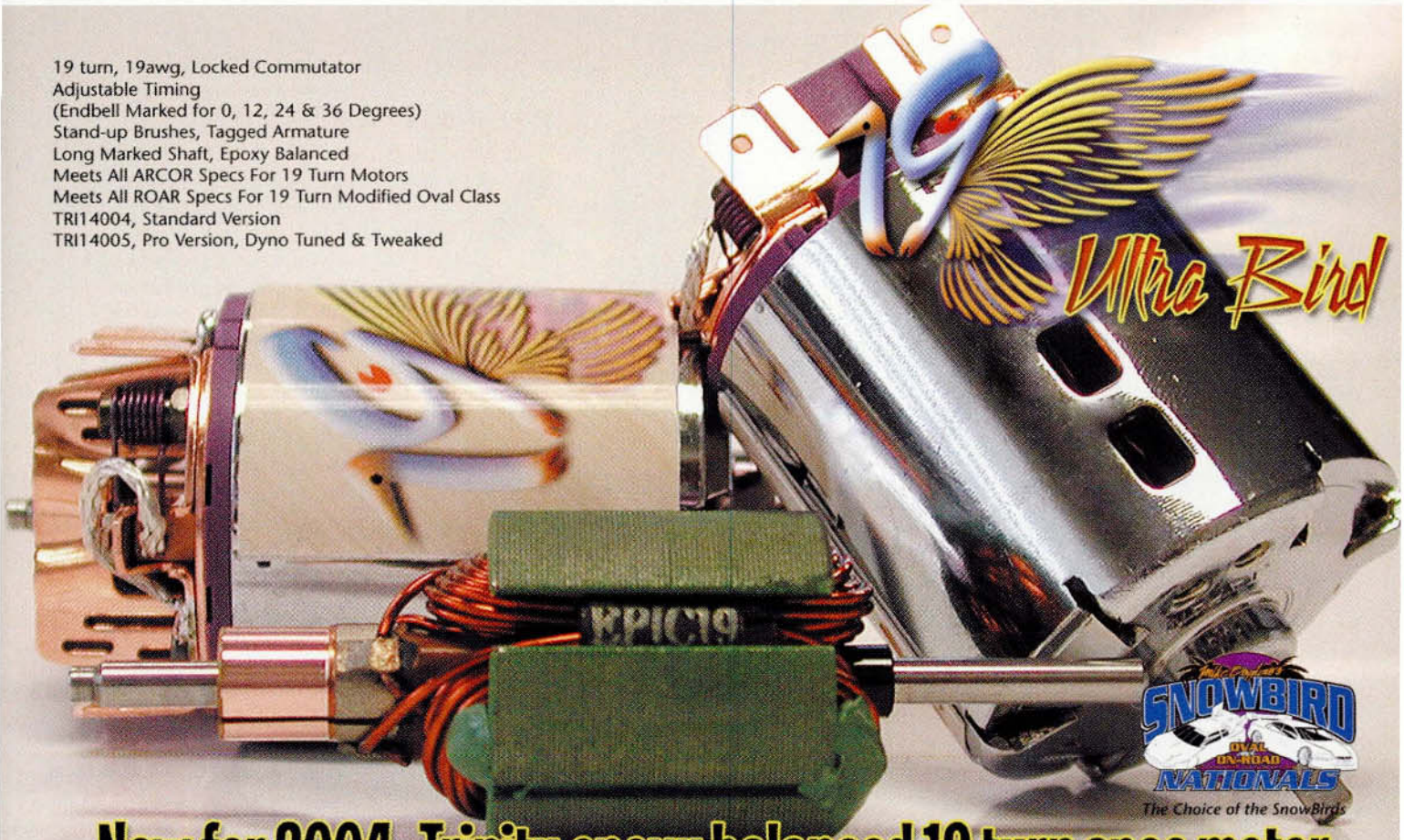


Protoform **Mini Alfa Romeo 2.0 & Mazda 6**

P-form's latest 1/18-scale shells each include a wing, mounting hardware and decal sheet. Inner spill plates can be added to the rear wing to enhance stability, and the oversize wing allows maximum adjustability and customization.

1470-00 (Alfa Romeo 2.0); 1471-00 (Mazda 6), $15/each

19 turn, 19awg, Locked Commutator
Adjustable Timing
(Endbell Marked for 0, 12, 24 & 36 Degrees)
Stand-up Brushes, Tagged Armature
Long Marked Shaft, Epoxy Balanced
Meets All ARCOR Specs For 19 Turn Motors
Meets All ROAR Specs For 19 Turn Modified Oval Class
TRI14004, Standard Version
TRI14005, Pro Version, Dyno Tuned & Tweaked



New for 2004, Trinity epoxy balanced 19 turn spec motor

If there is a drill hole, it's Illegal!

HOT FOR SUMMER

XTM Racing **Mammoth**

The Mammoth is, well ... mammoth! This factory-assembled monster comes with XTM's blazing-fast 24.7 engine (which puts out 2.6hp), a Hitec Lynx Sport radio, a 2-speed adjustable tranny, full ball-bearings, 8 threaded aluminum shocks and a high-torque metal gear steering servo. So how big is it? Overall length is more than 23 inches, and it stands almost 11 inches tall!

32437, $400

Integy **MSR5 piggy-back shocks**

Integy's latest shock set for monster trucks has heavy-duty 3.5mm shock shafts and working piggyback reservoirs for volume compensation. Threaded shock bodies make ride-height adjustments easy, and they're equipped with a progressive-rate spring set. Versions are available for the T-Maxx, Associated MGT and the HPI Savage.

Item nos. vary with application, $125

Kyosho **Mini-Z Cobra & Humvee**

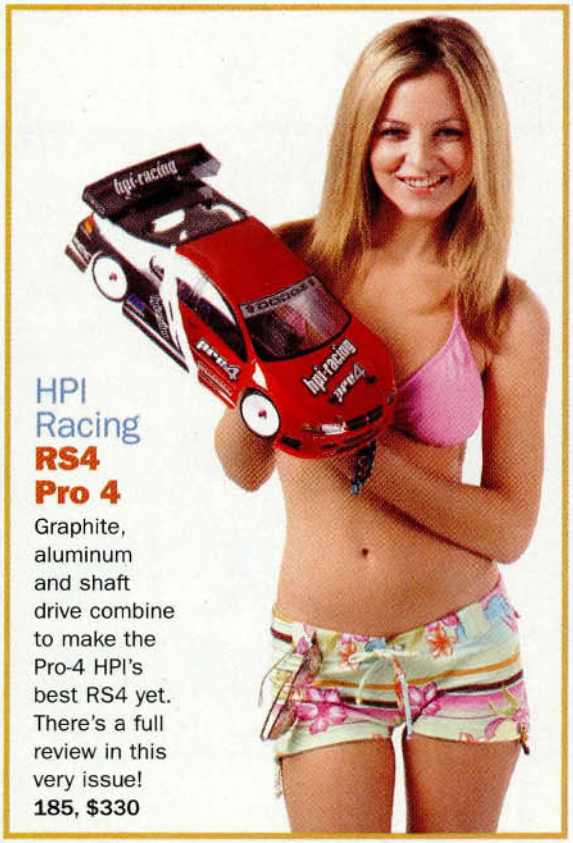
Kyosho is continuously expanding its Mini-Z line of cars and trucks; two of its latest include the high-performance classic AC Cobra and the original Hummer. The Cobra sits atop a newly modified MR-01F chassis, and the sand-color Humvee body sits on the more "off-roadish" Overland chassis.

KYOD40 (Cobra), $150; KYOD25 (Humvee), $165

Picco **Medium-block P2 .21 T-Maxx engine**

Picco's P2 .21 gives you the horsepower snap of a big-block engine in a medium-block package. It's designed to bolt right on to your T-Maxx without the need for a costly conversion kit. The P2 comes with aluminum engine mounts designed for the T-Maxx, and it accepts the truck's existing EZ-Start system. Not only that, the stock header is also just bolted right on the engine. According to Picco, this mill pumps out more than 2hp!

WRXP2M21, $300



HPI Racing **RS4 Pro 4**

Graphite, aluminum and shaft drive combine to make the Pro-4 HPI's best RS4 yet. There's a full review in this very issue!

185, $330

GS Racing **Avenger Storm Mk II**

According to GS, the Avenger has a 25-percent lower center of gravity than the original Storm thanks to a laydown servo setup, an in-line receiver box and other tweaks. Weight is down with a graphite radio tray, front-support plate and brake plate, and durability is up by way of 3.5mm shock shafts and captured hinge pins. It's gonna be hot.

Too new for item no. and price

HOT FOR SUMMER

CEN Racing **Genesis .46**

CEN Racing's Genesis is one big, burly truck. Not feelin' it? Try a .46 engine, four brake discs, 220cc tank, 7.5-inch tires and 10 shocks on for size. It even has a high-torque, metal-gear steering servo. It's gonna need it!

Too new for item no. and price

LRP **Quantum Competition 2**

LRP's top-of-the-line Quantum Competition 2 ESC features LRP's reactive software and is amazingly shock resistant and 100-percent waterproof! According to LRP, this digital, microprocessor-controlled speedo has the lowest resistance for minimum losses and maximum power.

LRP8083, $200

XRAY **XB8**

The XB8 is not only XRAY's first nitro-powered car, but it's the company's first off-road car as well! Like the XRAY cars that came before it, the big buggy will be top of the line all the way and will feature the best of the best—aluminum and graphite throughout, special Hudy spring-steel drive-train parts and other top-quality components.

Too new for item no., $675

Pro-Line **Hummer H2 SUT**

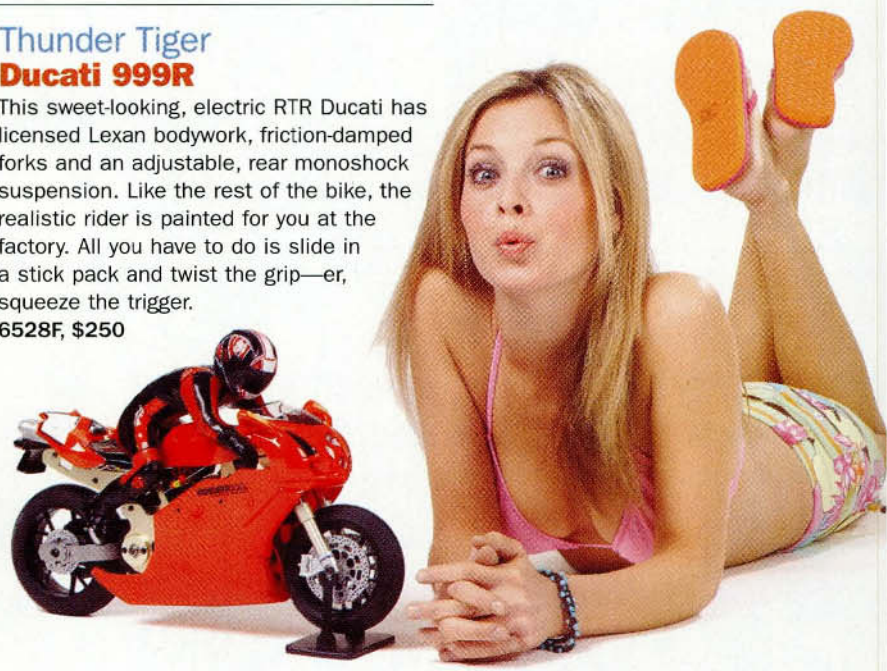
Pro-Line's new 2005 H2 Hummer body fits all of the popular Maxx and Savage trucks on the market. The SUT body comes with a full decal sheet that includes lights, grillwork and logos. The new Hummer H2 SUT comes complete with paint-then-peel protective film, window masking and is molded from crystal-clear 0.060-inch super-tough Lexan.

3150-00, $30

Thunder Tiger **Ducati 999R**

This sweet-looking, electric RTR Ducati has licensed Lexan bodywork, friction-damped forks and an adjustable, rear monoshock suspension. Like the rest of the bike, the realistic rider is painted for you at the factory. All you have to do is slide in a stick pack and twist the grip—er, squeeze the trigger.

6528F, $250



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COMPETITION ELECTRONICS (815) 874-8001; competitionelectronics.com.

EPIC MOTORSPORTS distributed by Trinity Products Inc.

FUTABA distributed exclusively by Great Planes; futaba-rc.com.

GREAT PLANES MODEL DISTIBUTORS (217) 398-6300; (800) 682-8948; greatplanes.com.

GS RACING (626) 338-3815; gsracing.com.

HORIZON HOBBY INC. (800) 338-4639; horizonhobby.com.

HPI RACING (949) 753-1099; hpiracing.com.

INTEGY INC. integy.com.

KO PROPO USA INC. (310) 532-9355; kopropo.co.uk.

KYOSHO distributed by Great Planes; kyosho.com.

LRP ELECTRONIC distributed by Team Associated; lrp-electronic.de.

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MULTIPLEX USA distributed by Hitec RCD (858) 748-6948; multiplexusa.com.

NOVAK ELECTRONICS INC. (949) 833-8873; teamnovak.com.

OFNA RACING (949) 586-2910; ofna.com.

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TAMIYA AMERICA INC. (800) 826-4922; tamiyausa.com.

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THUNDER TIGER/ACE HOBBY DISTRIBUTORS (949) 833-0088; thundertiger.com.

TRAXXAS CORP. (888) 872-9972; traxxas.com.

TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.

VENOM RACING (800) 705-0620; venom-racing.com.

XRAY MODEL RACING CARS distributed by Serpent USA; (305) 639-9665; teamxray.com.

XTM RACING distributed by Global Hobby Distributors (714) 964-0827; globalhobby.com.

YOKOMO USA (949) 252-8663; yokomousa.com.

tracktest >>>

1/8 SCALE 4WD COMPETITION NITRO BUGGY

BY PETER VIEIRA

Kyosho **Inferno MP-7.5**
Yuichi Kanai Edition III

WORLDS WEAPON

IN THE WORLD OF 1/8-SCALE BUGGIES, the Kyosho Inferno series is legendary, thanks to its six consecutive IFMAR World Championship titles. The original Inferno spawned the MP-5, MP-6 and the most successful of all the Infernos—the MP-7.5. Yuichi Kanai is the designer of the world champion 7.5, and in 2000, Yuichi actually won the title with the car he designed. To commemorate the win, Kyosho released a "Kanai Edition" MP-7.5. The signature model evolved into the Kanai II (which Greg Degani drove to victory at the 2002 IFMAR Worlds), and for the 2004 event, Yuichi has further honed the big buggy into the Inferno MP-7.5 Yuichi Kanai Edition III. With less weight, greater durability and increased suspension travel, the Kanai III is the ultimate Inferno and just may be the best buggy on the planet; we'll find out in August at the 2004 Worlds in San Paolo, Brazil. But you'll only have to wait as long as it takes to turn the page to get under the hood of the Kanai III.

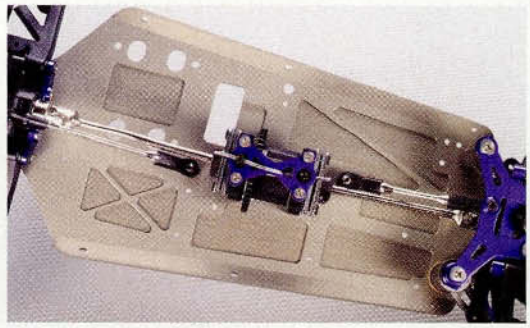
KIT FEATURES

CHASSIS. The Kanai III chassis is 3mm 7075 hard-anodized aluminum, which is as tough as 1/8-scale buggy chassis get. Like all MP-7.5s, the chassis has "blisters" punched into its underside that allow the differentials to sit a millimeter or so lower than they otherwise could, but unlike other MP-7.5s, the top of the Kanai III chassis is strategically milled to shave off precious grams; according to Kyosho, 1.4 ounces (40 grams) has been pared thanks to the process. A few more grams are trimmed by the liberal use of titanium hardware; more than half the kit's screws are made of everyone's favorite wonder metal.

The rest of the chassis features are standard MP-7.5 stuff. The radio box has separate receiver and battery compartments, the 2mm radio tray is secured by turned-aluminum standoffs, and rod braces bolster the gearbox/suspension assemblies.

Above: **here's the flip side. Note the hard-anodized color and the "blisters" under the diffs and flywheel that let the drive components sit extra low in the chassis.**

Left: **diff access is simple. Plastic housings may seem a bit down-spec on an $800 car, but the parts have proven themselves bombproof.**



A few minutes of CNC time takes 40 grams of aluminum off the chassis and puts it into the Kyosho factory recycling bin.

DRIVE TRAIN. Kyosho's Traction Control Differential (TCD) has been a staple of the Kanai series and returns with the III model. Unlike the Kanai II, which had TCDs front and center, the Kanai III only uses the TCD up front. The diff uses steel reinforcement plates to prevent the four, fine-pitch, hardened-steel spider gears from separating under load. The center and rear diffs use cast-alloy gear sets with coarser teeth. All three diffs are sealed, of course, so their action can be adjusted by varying diff-fluid viscosity, and the center diff's spur gear is steel. Universal-joint drive shafts join the diffs and connect the differentials to the stub axles.

Interestingly, the Kanai III does not have a fashionable 4-rotor brake system. A pair of vented-steel rotors that are squeezed by padded calipers do all the work, and its stiff brake springs don't have to be exchanged for sections of fuel tubing. The springs are a small touch but one that greatly increases brake feel and power. Each brake linkage is threaded, and adjustable via a knurled thumbwheel, so you can alter brake bias.

ENGINE AND ACCESSORIES. You won't find an engine or exhaust system in the Kanai III's box, but you will find everything you need to install them. A 3-shoe clutch with a lightweight flywheel is supplied and uses the usual mousetrap-style springs, but the shoes are made of aluminum, so they engage "harder" and wear longer. The engine mounts are machined aluminum and deeply finned to increase cooling; and they're attached to the chassis with plates that allow you to remove and reinstall the engine without altering the gear mesh. Fuel is supplied by a standard MP-7.5 tank with the usual features: internal stone filter, molded-in spillway and cap-mounted pressure tap. An ample splashguard alongside the tank keeps fuel away from the brake system and clutch bearings during fast fill-ups.

SUSPENSION AND STEERING. The Kanai III's shocks look like standard MP-7.5 units, but the rears are 2mm longer. That might not sound like much, but an extra 2mm at the shock eyelets translates into significantly more downtravel at the axles. The Kanai III's suspension verges on monster truck territory, so bumpy tracks shouldn't be a problem. Length notwithstanding, the shocks are standard Inferno stuff: aluminum bodies, heavy-duty 3.5mm shafts, bladder volume compensators, clip-on preload spacers and shaft-protecting rubber boots. The only uncool parts are the pins that hold the lower shock eyelets; they love to vibrate out. I'll replace them with screws later.

Along with extra travel, the Kanai III's suspension gets some extra adjustability. The kit includes two sets of front upper arms and hub carriers that let you select 20 or 22 degrees of caster, and the steering plate now has three holes for a greater range of Ackerman settings. New, heavy-duty, titanium-nitride-coated steel turnbuckles set camber and toe-in. Swaybars are standard (2.5mm front, 2.8mm rear), and the inboard hinge pins are held by 3mm aluminum plates behind the front gearbox on a machined-aluminum block, so they'll stay put in a crash.

BODY, WHEELS AND TIRES. Make that "body and wheels," since the kit doesn't include tires. The body is a standard MP-7.5 shell, but for Kanai III duty, precut Lexan reinforcements are provided to strengthen the area around the body posts. The wheels are standard Inferno 10-spokers in Kanai's trademark green, which is also the color of choice for the bi-level rear wing. Thick arms braced by aluminum standoffs hold the wing, and there are two wing-angle settings.

BUILDING & SETUP TIPS

Can we go ahead and assume that anyone with the dough and desire to pony up for a Kanai III already has some RC experience? Good. You'll have no problem getting the kit together, although a few tips can't hurt.

STEPS 16 TO 18. FRONT SUSPENSION. The hub carriers shown in the manual give 22 degrees of caster. If you want more aggressive steering, install the no. 305 (right) and 306 (left) carriers for the 20-degree setup.

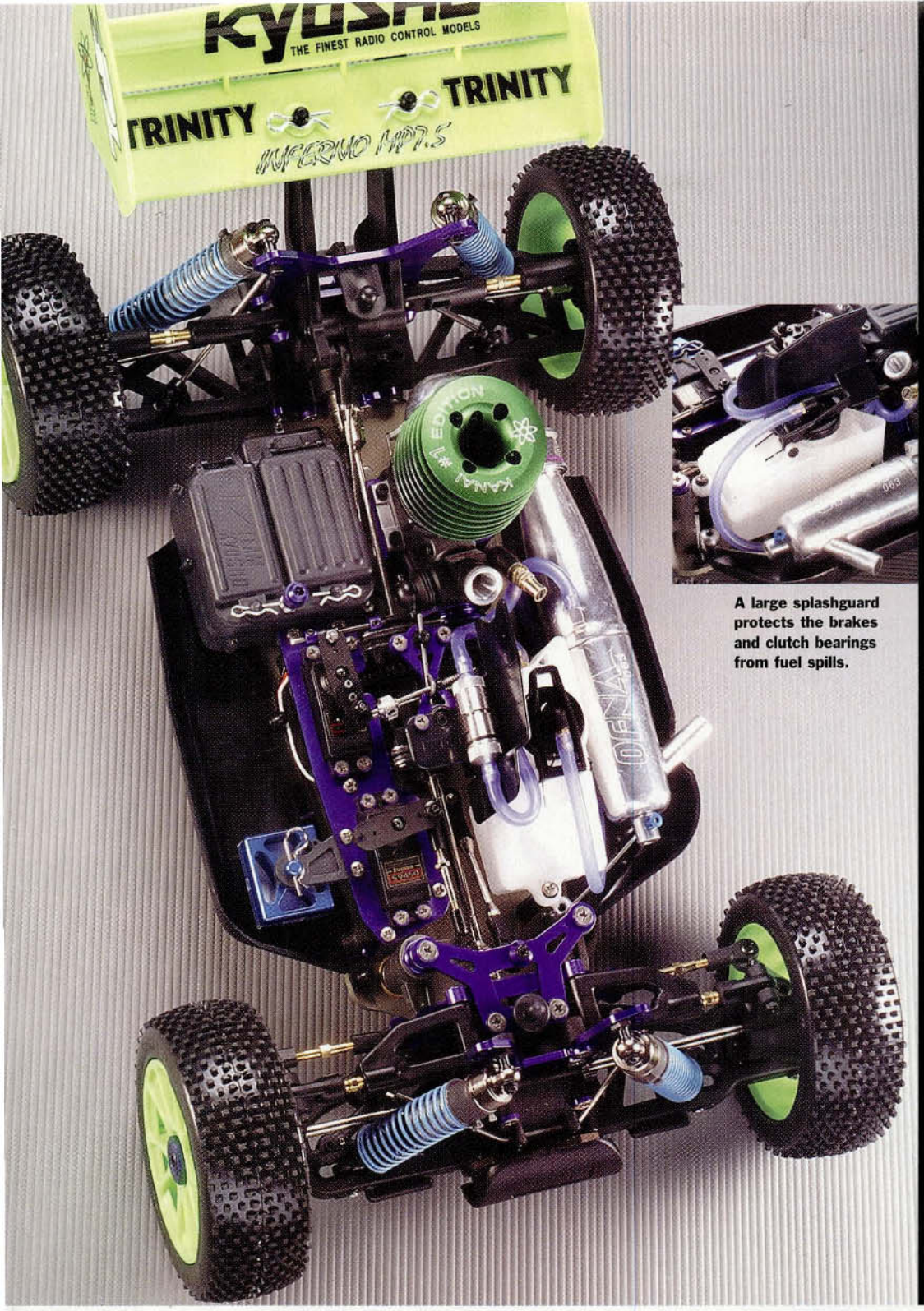
STEP 21. BRAKE-PAD ASSEMBLY. Glue the pads to the caliper plates with Shoe-Goo or Goop. The icon in the manual says "rubber cement," but that's just a Japanese translation thing.

STEP 28. ENGINE INSTALL. Install the mounting pads on the chassis first, and then bolt the engine into the chassis.

STEP 34. TRANSPONDER MOUNT
The manual shows a mount for an AMB personal transponder, and that's correct. But if you haven't moved up to a personal transponder yet, there's also a standard transponder mount in the box (it's on the same parts tree as the receiver-box lids).

you'll need

- Transmitter and receiver
- .21 rear-exhaust, bump-start engine with SG crank
- Tires
- Tire glue
- Steering and throttle servos
- Exhaust pipe and manifold
- Fuel
- Glow igniter
- Starter box
- Polycarbonate paint
- Shock fluid



A large splashguard protects the brakes and clutch bearings from fuel spills.

SPECIFICATIONS

MANUFACTURER Kyosho
MODEL Inferno MP-7.5 Yuichi Kanai Edition III
DISTRIBUTED BY Great Planes Model Distributors
SCALE 1/8
PRICE $800
Varies with dealer

DIMENSIONS
Wheelbase 13 in. (328mm)
Width 12.1 in. (307mm)

WEIGHT
Total, as tested 116 oz. (3,289g)

CHASSIS
Type Double-deck plate with rod stiffeners
Material 3mm 7075 aluminum, hard-anodized main chassis with 2mm blue-anodized radio tray/braces

DRIVE TRAIN
Type Shaft-driven full-time 4WD
Primary 46T steel spur gear/13T clutch bell
Drive shafts Steel universal joint
Differentials Sealed, 6-gear, silicone-filled; "TCD" front differential
Bearing type Rubber-sealed

SUSPENSION
Type Lower H-arm with turnbuckle camber link
Shocks Aluminum body with 3.5mm shaft and rubber shaft cover

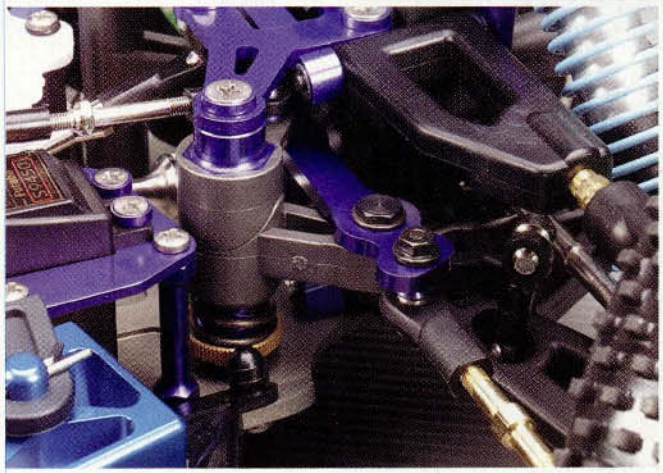
WHEELS
Type Kyosho 10-spoke
Dimensions Standard 1/8 buggy; 17mm hub

TIRES
Not included

ELECTRONICS
Not included

ENGINE AND ACCESSORIES
Engine Not included
Exhaust system Not included
Clutch 3-shoe, aluminum shoes
Fuel tank 125cc, primerless with internal filter

Left: the cast steering knuckles hide behind dirt shrouds molded into the front uprights. All of the Kanai III's drive shafts are universal-jointed.



Right: there are now three Ackerman positions on the steering bar. You can also see the machined-aluminum upper hinge-pin brace in this shot.

PERFORMANCE

RC Madness is Connecticut's hot spot for 1/8-scale off-road racing, and it was the ideal test venue for the Kanai III. I tested the big buggy before Madness' official opening day, so the track layout was only roughed in and was definitely on the gnarly side of the terrain spectrum—all the better to test the Kanai III's longer legs.

With a full tank of Trinity Platinum Blend 30-percent nitro in the tank, the Kanai III was ready to hit the starter box. The engine was already broken in and pretty much dialed after the photo shoot a week earlier, so all I had to do was drive. Easier said than done! As quickly as I could get on the gas, it was time to let off and pitch the Kanai into the first turn. The buggy would push if I overcooked it, but the limits were very high, and the steering is very neutral until the Pro-Lines can take no more. The dual swaybars keep the chassis flat despite the leggy suspension. As weight transfers rearward during corner exits, the Kanai III digs in very hard. Once the buggy was lined up, I could squeeze the trigger and practically take my hand off the wheel.

A lot of the buggies at Madness seem to be set up low and stiff to skip over bumps. It works, but they lose a lot of momentum to wheelspin. The Kanai III was much more supple, and its suspension pumped through the rough as it put power down. The track's deep Bobcat treads were able to buck the buggy, but you'll never see that kind of erosion on a properly groomed track. Bumps like those you'd see in real racing were easily absorbed.

The long suspension that helped give the Kanai III its bump-eating prowess also made it a great jumper. It stayed lower and flatter than I expected (no doubt because the suspension was absorbing energy that is normally transferred to the buggy), and there was ample cush for soft landings. Every second spent in the air is a second you can't use to put down power, so the Kanai III's ability to jump low and keep power on the ground longer can only help lap times.

Strong brakes also cut lap times by letting you stay on the gas longer before braking for turns. The Kanai III's brakes call into question the need for "quad" systems with four rotors. Brake feel was excellent, and wheel-locking power was always in reserve. Once the bias had been set properly and the servo endpoint had been set just shy of lockup, I could jam the trigger the instant before a hairpin turn, and the Kanai III would hook it as if it had ABS.

THE VERDICT

A six-time world-champion buggy platform with the best factory racing gear tweaked by the designer himself. What's not to like about the Kyosho Inferno MP-7.5 Yuichi Kanai Edition III? Just two things: the price (which is defensible given all the car has, but man, 800 bucks!) and the silly shafts that hold the lower shock eyelets (and love to vibrate out). But what's the cost of four 3mm screws when you're already into it for eight bills? Cost isn't the point here. The Kanai III is a no-holds-barred racing machine; backyard bashers and price-point shoppers need not apply. Judged as such, the Kanai III is arguably as good as competition buggies get, and come August, when Team Kyosho take on the world in Brazil, they just might dispel "arguably" with a seventh world-championship title.

LIKES

- Ready to race at any level; no upgrades required.
- Legendary MP-7.5 performance.
- Includes parts for 20- and 22-degree caster settings.

DISLIKES

- You wanna play, you gotta pay; try $800 on for size.

TEST GEAR

Futaba 3PK transmitter and R203HF receiver

A world-class buggy deserves world-class radio gear, and the Futaba 3PK definitely fits the bill. The futuristic super radio has every adjustment you could ever need for racing, including exponential, servo speed, and three timer functions, plus nitro-specific features such as idle-up and ABS braking that make the 3PK ideal for big-buggy duty. Futaba's High Response System is also on board for super-responsive steering and throttle feel when using digital servos.

Additional items used to complete the Kanai III:

Futaba S9450 digital steering and throttle servos

Sirio S21BK Kanai Edition engine

OFNA spring-coupled tuned pipe and manifold

RATING THE KYOSHO INFERNO MP-7.5 YUICHI KANAI EDITION III

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
INSTRUCTIONS	Pretty good; certainly fine for the experienced builders for whom the car is intended.				
PARTS FIT & FINISH	No issues with fit; all the parts are nicely (if not extravagantly) finished.				
ACCELERATION	The Kanai III puts power to the ground with impressive efficiency and stability.				
CORNERING ABILITY	Neutral and smooth with well-defined limits. As good as it gets.				
BUMP & JUMP HANDLING	Exceptional rough-track handling; get ready to pass lesser machines.				
DURABILITY	Aside from the slippery shock pins, the Kanai III stays together well.				

ESTIMATED TOP SPEED 45MPH* **BEST BUYER** Serious and skilled 1/8-scale off-road racers

** Top speed varies with equipment used.*

SOURCES

FUTABA distributed exclusively by Great Planes Model Distributors; futaba-rc.com.

GREAT PLANES MODEL DISTRIBUTORS (217) 398-6300; (800) 682-8948; greatplanes.com.

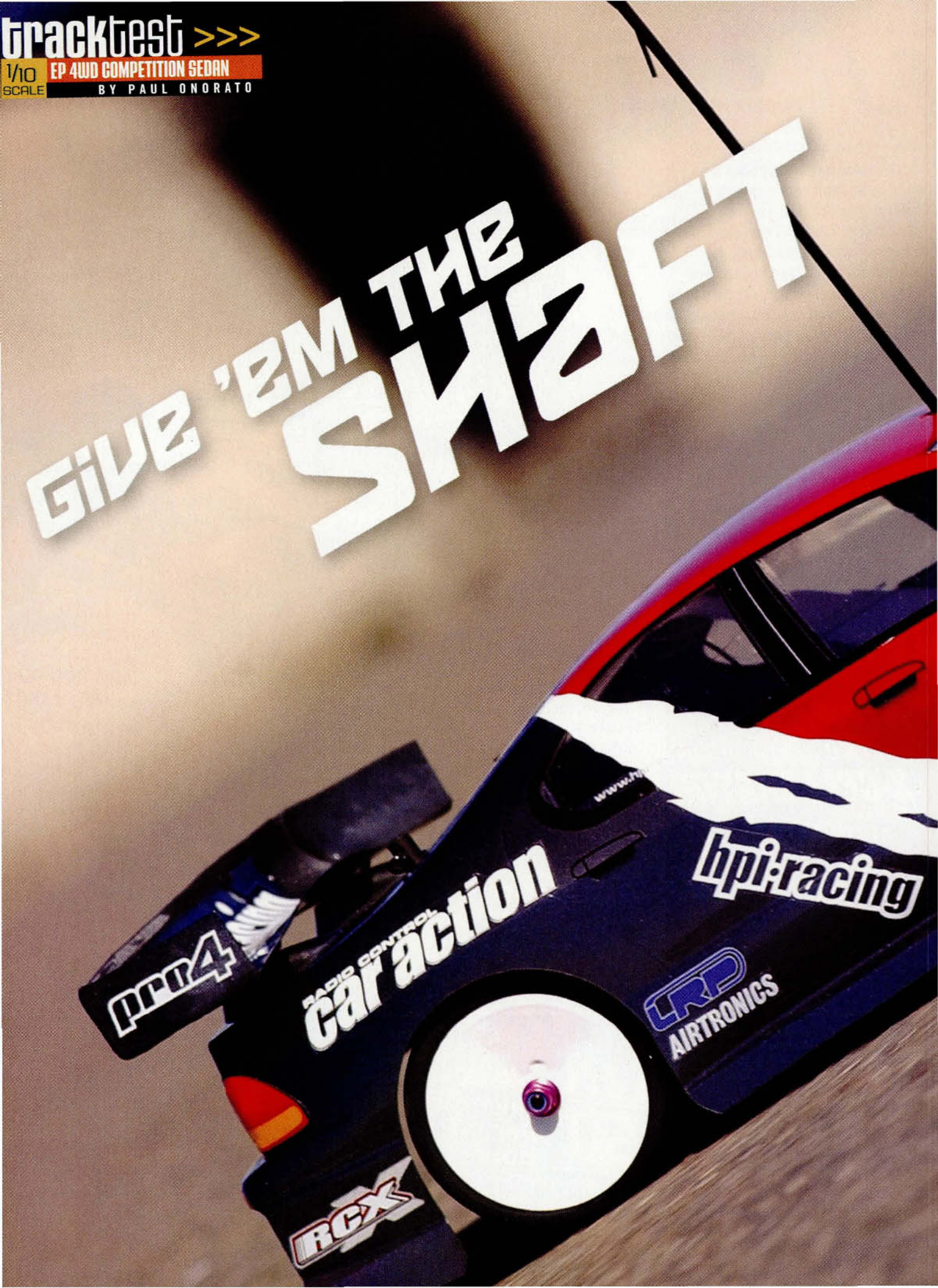
KYOSHO distributed by Great Planes Model Distributors; kyosho.com

SIRIO distributed exclusively by Trinity Products Inc. (732) 635-1600; teamtrinity.com.

OFNA RACING (949) 586-2910; ofna.com.

BY PAUL ONORATO

Give 'em the SHAFT



NEWS FLASH!

Hara & HPI Pro 4 win the DHI Cup

Atsushi Hara recently won the DHI Cup in Denmark with his new HPI Pro 4. Hara TQ'd the event and went on to win all three A-mains. His most impressive feat of the weekend was during the first of the A-mains. He got caught up in a first turn crash that left him dead last, but he worked his way past a very talented group of racers to win the race.

HPI **RS4 Pro 4**

THE HPI RS4 PRO 4 IS ONE OF THE MOST HIGHLY ANTICIPATED competition electric touring cars to be released this year. At last, the wait is over. The Pro 4 is a complete departure from the unusual 3-belt Pro 3 and all the belted RS4s before it. The Pro 4 boasts a new shaft-drive system and entirely new suspension and steering designs. HPI also made sure that nothing but the best materials made it into this flagship touring car: graphite plate for the chassis; molded graphite for the suspension components; titanium turnbuckles; MIP CVDs; and more. Clearly, the Pro 4 has winning features, but is it a winner on the track?

KIT FEATURES

CHASSIS. The RS4 Pro 4's chassis plate is a superbly cut 2.5mm graphite plate with a woven carbon-fiber finish. Openings allow the motor, batteries and spur gear to be mounted as low as possible and also direct cooling air to the motor and battery pack. The chassis' layout is similar to those on other shaft-driven touring cars: the battery slots are on the left and the motor and other electronics are on the right. These components are mounted as close as possible to concentrate their weight along the chassis' center for best handling. A woven-graphite upper deck runs between the front and rear gearboxes and is also fastened to the steering bellcranks and aluminum motor mount, which makes the Pro 4 chassis exceptionally rigid.

If you own stick packs, you'll be glad to hear that HPI includes battery rails that accommodate that style. Side-by-side packs can be mounted with strapping tape or the included battery strap.

DRIVE TRAIN. The Pro 4's shaft-driven design makes it a major departure from previous RS4s. This new design allowed the engineers to place the drive train low enough to significantly reduce the car's center of gravity—so low, in fact, that an opening in the chassis had to be made to allow clearance for the spur gear.

The aluminum drive shaft is cradled by two lightweight, but rigid, carbon-graphite drive cups that are mounted on the bevel-gear shafts. The 64-pitch spur gear is fitted with an aluminum mount and is keyed to the rear bevel shaft. A heavy-duty aluminum motor mount holds the motor in position and also supports the rear bevel-shaft/spur-gear arrangement.

A one-way diff unit with aluminum drive cups is spec'd for the front end, and a ball diff handles the rear power distribution. The rear diff drive cups are made of carbon-graphite to reduce rotating mass, and superstrong carbide diff balls keep the diff action smooth and consistent. MIP CVDs relay the power from the diffs to the wheels.

The Pro 4's drive train spun silky smooth once it had been fully assembled; it didn't require any hand-fitting, and that isn't always the case with competition touring cars. This can be attributed to the flawlessly molded carbon-graphite gearboxes that hold the drive parts in precise alignment and to the high-quality ball bearings used throughout.

SUSPENSION AND STEERING. HPI did its homework and incorporated a ton of tuning options into the Pro 4's suspension. The super-tough carbon graphite used for the gearboxes found its way onto the suspension arms, uprights and steering knuckles. Four sets of different front uprights are included to allow camber changes, and downtravel can be varied by turning the droop screws in the suspension arms. The inboard hinge pins are held with machined-aluminum pivot blocks, and the outboard pins are held by setscrews instead of annoying E-clips. The elimination of E-clips is not the only benefit; the design makes it possible to adjust front and rear toe by replacing the pivot blocks, and front anti-dive and rear anti-squat can be altered by adding or removing spacers of different widths below the pivot blocks. Wheelbase adjustments can be made by moving aluminum spacers of different sizes on either side of the rear upright. Front and rear swaybars are standard.

Another feature of the Pro 4's suspension design is its camber-link setup. The inner ball studs for the camber links are mounted vertical on the gearbox, so you can alter the height of the camber link by using washer stacks of different sizes. There's also a choice of camber-link mounting holes. By making these adjustments and using different spacers below the pivot blocks, you can change roll center and tune the chassis for more or less traction. And, of course, the upper links feature titanium turnbuckles, so you can easily adjust camber without having to take anything apart.

HPI's smoothly operating aluminum shocks keep the ride smooth and controllable. Threaded shock bodies make precise ride-height adjustments a cinch, and firm bladders with rebound foam ensure reliable damping. The 3mm shock towers are molded of the same woven-graphite material as the chassis. To add to the Pro 4's adjustability, the shock towers have four upper shock-mounting locations and two lower ones on the front suspension arm and three on the rear.

The well-designed steering system's six ball bearings offer ultra-smooth action and make it virtually slop-free. It uses a dual-bellcrank system with an integrated, adjustable servo-saver on the left post. The

BUILDING & SETUP TIPS

The RS4 Pro 4 will go together without any hiccups as long as you take your time and closely read each and every step. The instructions are well illustrated, the parts bags are clearly labeled, and the parts are of high quality, but there are always tips that can help you along the way.

THREAD-LOCK. Use thread-lock on all of the screws that go into metal parts so that they won't be able to back themselves out.

DIGITAL CALIPERS. Several steps in the building process require precise measurements, so do yourself a favor and pick up a set of digital calipers. You can get by with a ruler, but it won't be nearly as accurate as calipers.

STEP 1: CHASSIS PREP. You can make the graphite shock towers even stiffer by applying CA to the edges just as you did for the chassis plate.

STEP 8: SERVO-SAVER ASSEMBLY. When you tighten the servo-saver adjusting nut to compress the spring, set it so that 1.5mm of the servo-saver post is exposed. This will allow enough "give" in the system but won't reduce steering precision. For high-grip tracks, you might dial in a little more spring tension.

STEPS 12 & 16: THE GAP IS GOOD! When you screw down the top halves of the gearboxes, you will notice gaps on either side where the outdrives exit. This is not a mistake. The gearboxes are designed so that once everything has been tightened up, the drive-train alignment will be correct and the bearings will not be clamped.

STEP 16: SPUR-GEAR INSTALLATION. Pay attention to the positions of the Z877 washers when you install the spur-gear assembly. They should be installed next to the bearing that's closest to the spur gear.

STEP 26: SWAYBARS. Install the ball ends on the swaybars so that the setscrews face upwards. If they face downward, they might hit the axles when the car goes over big bumps.

you'll need

- Transmitter and receiver
- ESC
- Motor
- 6-cell battery pack
- Battery charger
- Steering servo
- 64-pitch pinion
- Wheels, tires, inserts
- Body
- Polycarbonate paint

factory options

- Racing spring set
- Finned heat-sink motor mount
- Delrin diff outdrives
- Delrin pivot balls
- Titanium screw set
- Ballast weight set

Part numbers weren't available at time of publication.

THE COMPETITION

	CHASSIS	SWAYBARS	FRONT DIFF TYPE	DRIVE AXLES	WHEELS/TIRES	BEARINGS	PRICE**	REVIEWED
HPI RS4 Pro 4	**Graphite plate**	**Yes**	**One-way**	**MIP CVDs**	**Not included**	**Metal-shielded**	**$299**	**6/04**
MRC/Academy STR-4 Pro	Graphite plate	No	Ball	CV-type	6-spoke/slicks	Metal-shielded	$199	11/01
Tamiya TB Evo III Surikarn Limited	Graphite plate	Yes	One-way	CV-type	Dish/slicks	Rubber-sealed	$420	10/03
Team Associated Team TC3	Plastic semi-tub	Yes	Ball	MIP CVDs	Not included	Rubber-shielded	$300	5/01
Yokomo MR-4TC SD SSG	Graphite plate	Yes	Ball	CV-type	Not included	Metal-shielded	$330	9/03

*Partial list; category is too large to list all competitive vehicles. All vehicles shown are shaft-driven. **Price varies with dealer.

SPECIFICATIONS

MANUFACTURER HPI Racing
MODEL RS4 Pro 4

SCALE 1/10
PRICE $299
Varies with dealer

DIMENSIONS
Wheelbase 10.08 to 10.2 in. (256 to 259mm)
Width (F/R) 7.36 to 7.48 in. (187 to 190mm)/7.32 to 7.44 in. (186 to 189mm)

WEIGHT
Total, as tested 51.84 oz. (1,470g)

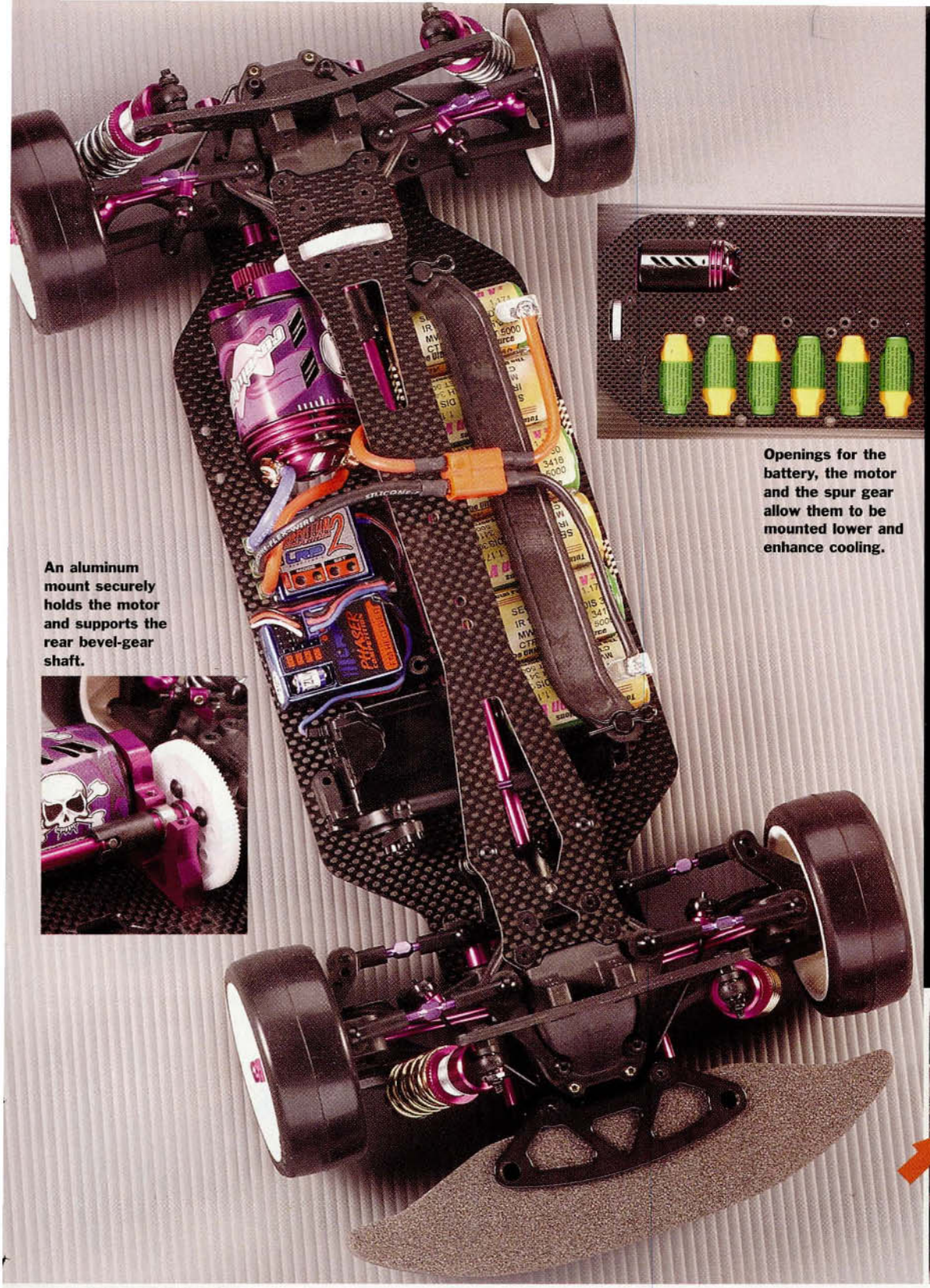
CHASSIS
Type Double-deck plate
Material Woven-graphite 2.5mm

DRIVE TRAIN
Type 4WD shaft
Primary 98T spur gear/31T pinion (as tested, not included)
Drive-train ratio 2.44:1
Drive shafts MIP CVDs
Differentials (F/R) One-way unit/ball type with plastic outdrives
Bearing type Metal-shielded ball bearings

SUSPENSION
Type Lower H-arm with upper turnbuckle camber link
Shocks Threaded-body aluminum with bladders

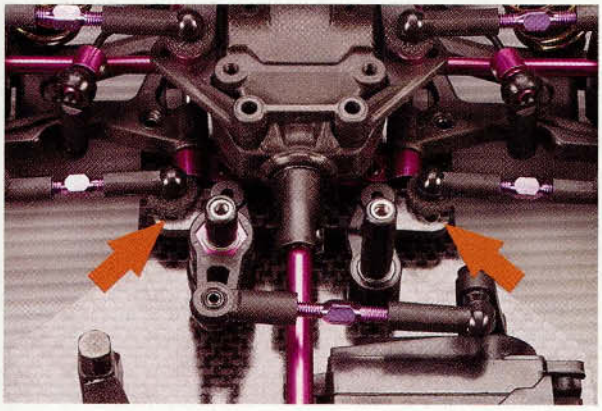
WHEELS & TIRES
Not included

ELECTRONICS
Not included



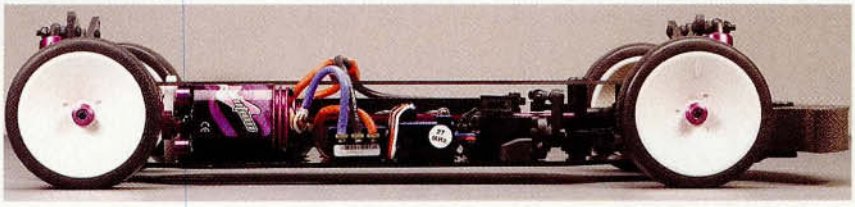
Openings for the battery, the motor and the spur gear allow them to be mounted lower and enhance cooling.

An aluminum mount securely holds the motor and supports the rear bevel-gear shaft.



Left: the steering system is fully supported by six ball bearings that ensure smooth steering and slop-free movement. Notice the Ackerman adjustment (arrowed) on the woven-graphite drag link. **Below:** one of the benefits of a shaft-drive design is that it allows the entire drive train to be mounted as low as it can go for an ultra-low center of gravity—something that isn't possible with a belt-drive car.

Above: adding or removing the purple washers (arrowed) under the camber-link mount allows you to adjust the chassis' roll balance. Foam rings prevent dirt from contaminating the ball cups.



woven-graphite drag link has several steering-linkage hole options: there are four Ackerman positions to choose from. The tie rods and even the link between the servo and the bellcrank have titanium turnbuckles.

BODY, WHEELS AND TIRES. Like most competition-level touring cars, the Pro 4 does not come with a body, wheels, or tires. These are left up to you so that you can choose what suits the track you intend to race on. I chose an HPI 190mm Dodge Stratus Aero 2 body finished with Tamiya polycarbonate spray paint.

I stayed in the HPI family by using a set of 24mm Racing Slick belted tires in the 27R compound and Pro Molded inner, medium foam inserts, and I mounted them on Aero-Dish wheels. This combo is a good middle-of-the-road starting point for most surfaces.

Evolution of the Pro 4

We speak with designer Erik Shauver

Erik Shauver joined the team at HPI Racing roughly four years ago. He started by designing instruction manuals and today designs RC cars. Erik is responsible for the development of HPI's latest touring car, the RS4 Pro 4. I recently had the chance to speak with him about the Pro 4, and this is what he had to say.

Radio Control Car Action: When you set out to design the RS4 Pro 4, what was your main objective?

Erik Shaver: My goal was to design a car with club racers in mind and to give them all the adjustments they need to tailor it to whichever type of track they run on and the cars they compete against. The suspension was a total redesign and is very versatile so that it can be changed to match, let's say, a TC3's setup.

RCCA: Which part of the Pro 4's design are you most proud of?

ES: We worked very hard so that no hand-fitting is required when you assemble the gearboxes. Just put them together, and the drive train will spin silky smooth. Atsushi Hara does not have to do anything special to the gearboxes in his car and neither do consumers; they end up with a pro car just like the one that Hara drives. If the Pro 4 had not turned out this way, consumers would have to know what needs to be modified and would also have to be able to carry out the modifications to get the car equal to a pro's car. I am also very happy with the steering design, which is more aggressive than any other car's.

RCCA: With just one glance at the chassis, it's obvious that the Pro 4's design is a huge departure from the Pro 3. Why is it so different?

ES: The Pro 3's design was ultra-innovative and explored new ground; unfortunately, it was not well received. With the Pro 4 we followed a more conservative route and paid close attention to details. Basically, we followed the design of the Pro 2 more than the Pro 3.

RCCA: Are you happy with the Pro 4?

ES: Yes; after two years of development, the car turned out very well, but as a designer, there is a part of you that feels you could have done even more if time had not been an issue.

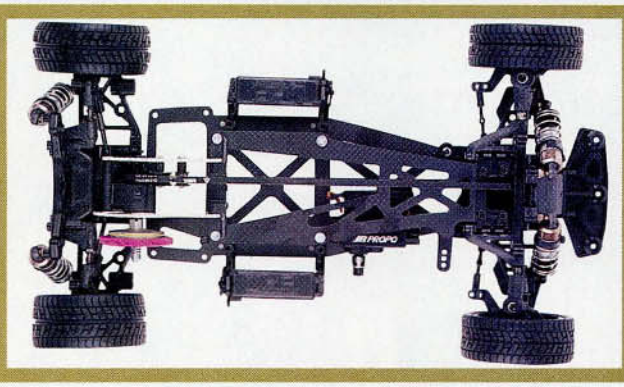
RCCA: But then we'd never see any new cars! Thanks for the insights, Erik.

RS4 Flashback

Few cars have been as influential in RC touring circles as HPI's RS4 series. Here's a look at the progression from the original gearbox car to today's shaft-drive machine.

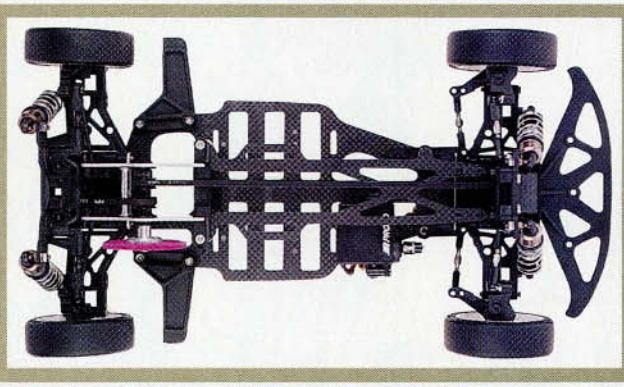
1995: ORIGINAL RS4

The original RS4 was the first widely available "serious" touring car to follow the Tamiya TA Series cars that set the stage for the touring boom. The first RS4 featured a rear 3-gear transmission with a slipper clutch that spun the front diff via a belt. Width was adjustable to suit various bodies: the standards of 190 and 200mm hadn't been set back in 1995.



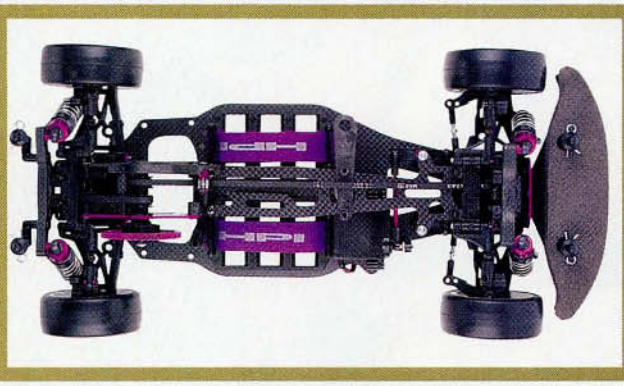
1997: RS4 PRO

The RS4 Pro was clearly influenced by racers' input, and the chassis had saddle-pack battery mounting, ball bearings and a dual-belt drive train with front and rear ball diffs—no more rear gearbox. Note the fashionably skinny tires; they were soon outlawed by racing regulations.



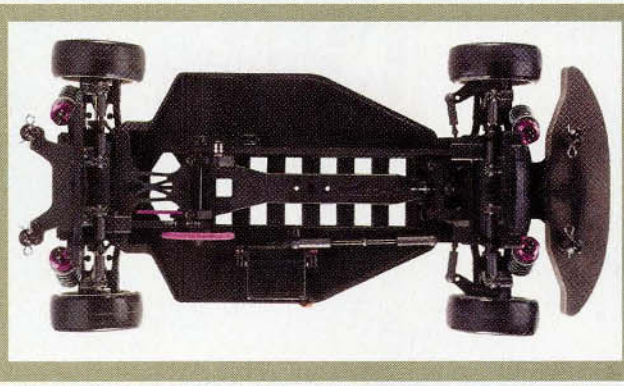
1999: RS4 PRO 2

Basically a more refined version of the Pro. Weight distribution was improved by pulling the batteries closer to the chassis' centerline, the suspension geometry was altered to suit racers' needs, and the drive axles exited the outdrives in line to increase drive-train efficiency. The Pro 2 was also the first HPI car to feature those signature purple-anodized aluminum parts.



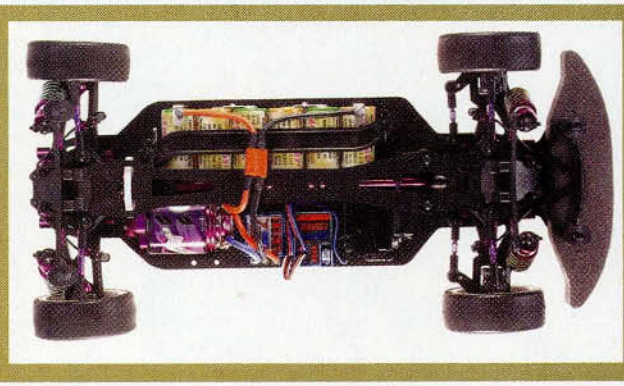
2001: RS4 PRO 3

HPI took a gamble with the Pro 3, which substituted a graphite chassis for plastic, and challenged conventional design wisdom with its wide diff/short drive-axle system and inline battery pack. Unfortunately, racer response was less than enthusiastic.



2004: RS4 PRO 4

Back on top! The Pro 4 brings the RS4 series back to top-of-the-line mode with its graphite chassis, threaded-aluminum shocks, slick shaft system and plenty of purple. It's the most adjustable, best performing RS4 yet.



PERFORMANCE

As soon as the Fusion battery had peaked, I headed to the parking lot for the Pro 4's first run. This run would give me the chance to tweak the car as required before I headed to Hobby Chamber in West Haven, CT, for track time. Straight out the box with the standard settings, the Pro 4 felt pretty good on the unswept pavement. After a few figure-8s to check the tweak and a couple of droop-screw twists to dial it in, we were ready for the track.

Hobby Chamber's flawless asphalt track is treated with VHT for traction, but when freshly applied, the stuff is actually oily. The HPI slicks skated on it, so I swapped them for a set of SpeedMind foams: 26mm up front, 30mm in the rear and 37-shore all the way around. They were the hot ticket; the car now had plenty of traction.

I was really impressed by the Pro 4's lightning-fast acceleration off the line and also by its throttle response when I powered out of corners. The efficient shaft drive instantly sends power to the wheels without any lag time, and that saves you precious time. The Team Orion Revolution Hara Pro Edition motor provided plenty of power and pulled hard all the way down the long straightaway. I gave the trigger full clamp coming onto the straight, and the Pro 4 did not step out at all. Maybe it was just that the foam tires hugged the VHT, but the Pro 4 just didn't seem to suffer from the torque-steer effect that's common in shaft cars with similar layouts.

Through the track's many curves, the Pro 4 was very responsive to my inputs and relatively easy to drive. The chassis stays flat in the corners—no chassis roll—and the car transitions quickly from corner to corner. HPI's efforts to position the motor and battery low and close to the car's centerline definitely pay off. The Pro's aggressive steering gets it around the track quickly, and if the back end does come around, you can almost anticipate it and still maintain control.

I usually drive touring cars that are full-time 4WD, and the front one-way diff took some getting used to. The brakes need only a light touch, since all the stopping force comes from the rear wheels. It's easy to lock them up, and the result is an instant spinout if the car is also countering cornering forces. I prefer full-time 4WD, but for a skilled driver on a high-bite track, a one-way is the hot setup—and that's exactly the types of driver and conditions the Pro 4 is built for.

One thing the Pro 4 isn't built for is bashing. Its molded-graphite parts are stiffer than most plastics, but that means they can't flex as much without breaking. The Pro 4 is as strong as other similarly equipped cars, but if you tend to rail the boards, it won't be as forgiving as a "sport" car like HPI's RS4 Sport 2 might be. I clipped a board and managed to break an arm, but I wouldn't say this was caused by a weakness in the Pro 4. If you're a racer, you know that some types of impact inevitably break cars.

THE VERDICT

From the first step in the assembly to the last hot lap on the test track, the RS4 Pro 4 clearly proved itself a worthy opponent. It was straightforward to build and can more than hold its own when the starting tone chimes. The chassis features a plethora of high-quality parts and is loaded with tons of tuning options. The one drawback for me was the front one-way diff unit; it does not suit my driving style, but I can overcome that with practice. In case you haven't guessed: I love this car, and it will be my number-one choice for racing this year.

LIKES

- Highly adjustable chassis and suspension.
- Smooth drive train.
- Loaded with high-quality parts.
- Straightforward assembly.

DISLIKES

- Front one-way setup isn't ideal for all tracks.
- Diffs are difficult to access for maintenance.

TEST GEAR

Fusion Batteries
Fusion Team Grade Pack
This pack uses voltage-enhanced, matched GP3300 cells that are assembled using a patent-pending, super-quick soldering process that reduces the amount of heat that enters each cell; this gives every cell more punch. The packs also have heat-sink battery bars to help dissipate heat, and the cells are glued together for strength.

Additional items used to complete the HPI RS4 Pro 4

Team Orion **Revolution Hara Pro Edition 11x1 motor**

LRP **Quantum Competition 2 ESC**

LRP **Phaser Competition receiver**

Airtronics **MX-3 transmitter**

Airtronics **94737Z Contest high-speed servo**

Robinson Racing **31T, 64-pitch pinion gear**

SpeedMind **foam tires 37 shore**

HPI **Dodge Stratus Aero 2 body**

Tamiya **polycarbonate paint**

Deans **Ultra Plugs**

Deans **Wet Noodle wire**

RATING THE HPI RS4 PRO 4

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
INSTRUCTIONS	HPI does a great job in clearly illustrating each of the assembly steps.				
PARTS FIT AND FINISH	All of the parts are first-rate and didn't require any extra attention.				
CORNERING ABILITY	It's quick through corners once you are accustomed to the front one-way.				
ACCELERATION	Lightning-fast off the line with the shaft drive and rubber slicks.				
DURABILITY	The Pro 4 is as durable as a race car needs to be, but it isn't built for bashing.				

RADAR TESTED TOP SPEED 36.2MPH*

BEST BUYER All touring car racers and any fans of competition gear.

** Top speed varies with equipment used.*

SOURCES

AIRTRONICS (714) 978-1895; airtronics.net.

FUSION BATTERIES (954) 345-8792; fusionbatteries.com.

HPI RACING (949) 753-1099; hpiracing.com.

LRP distributed by Team Associated (714) 850-9342; teamassociated.com.

ROBINSON RACING PRODUCTS (209) 966-2465; robinsonracing.com.

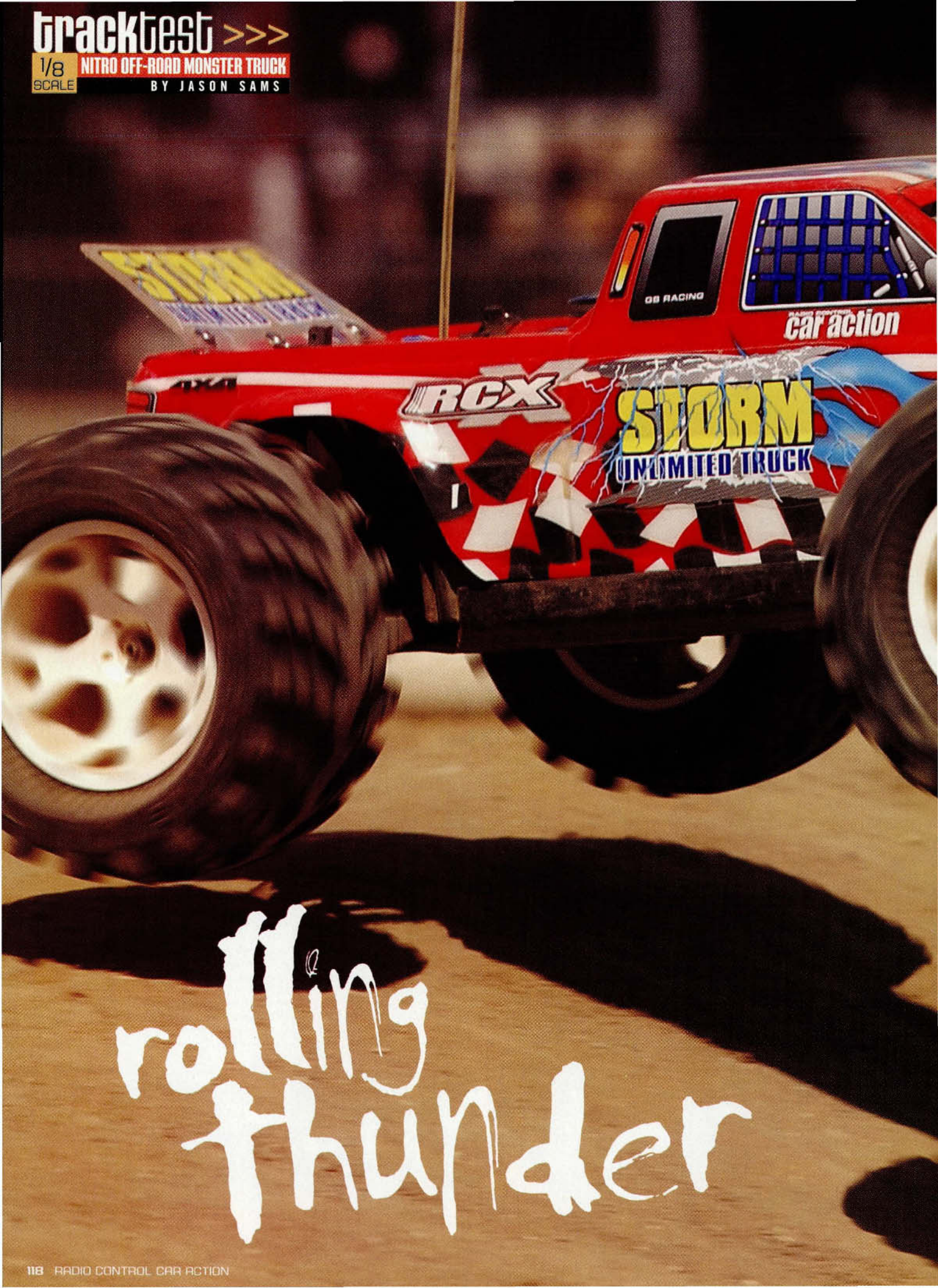
SPEEDMIND distributed by Magma Intl. Ltd. (905) 886-1808; speedmind.ca.

TAMIYA AMERICA INC. (800) 826-4922; tamiyausa.com.

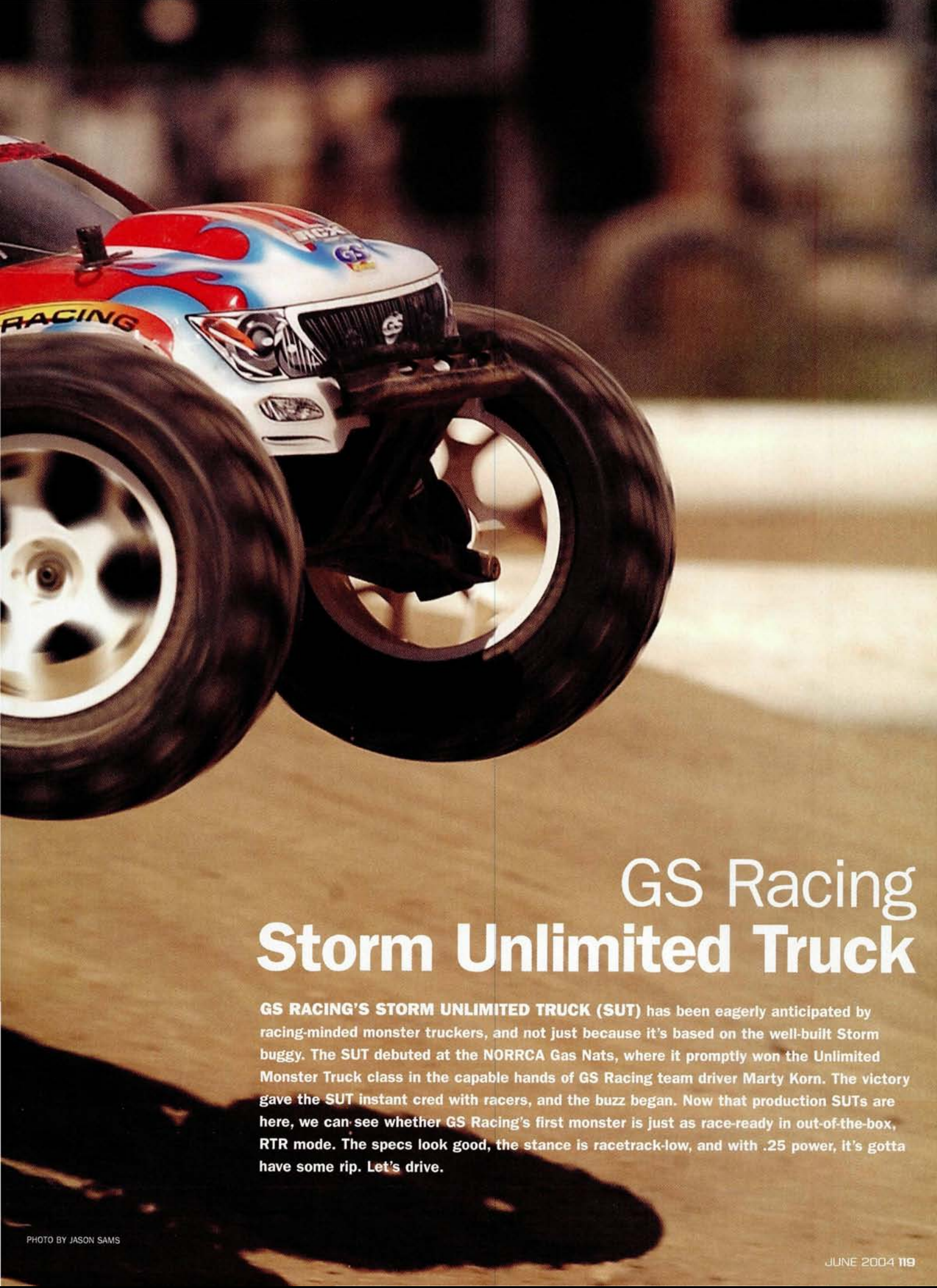
TEAM ORION INC. (714) 694-2812; team-orion.com.

W.S. DEANS CO. (714) 828-6494; wsdeans.com.

BY JASON SAMS



rolling thunder



GS Racing
Storm Unlimited Truck

GS RACING'S STORM UNLIMITED TRUCK (SUT) has been eagerly anticipated by racing-minded monster truckers, and not just because it's based on the well-built Storm buggy. The SUT debuted at the NORRCA Gas Nats, where it promptly won the Unlimited Monster Truck class in the capable hands of GS Racing team driver Marty Korn. The victory gave the SUT instant cred with racers, and the buzz began. Now that production SUTs are here, we can see whether GS Racing's first monster is just as race-ready in out-of-the-box, RTR mode. The specs look good, the stance is racetrack-low, and with .25 power, it's gotta have some rip. Let's drive.

PHOTO BY JASON SAMS

KIT FEATURES

CHASSIS. The SUT's 3mm, 6061 anodized-aluminum chassis has been lifted from GS Racing's Storm 1/8-scale buggy. Radiused sides and braces are secured to the chassis' front steering plate and rear bulkhead to add strength and rigidity. Eight degrees of kick-up in the front end help the suspension handle rough track conditions and nose-heavy jump landings by preventing the front end from digging in when it lands front wheels first. The layout of the electronics, engine and fuel tank is exactly like that of an 1/8-scale buggy. The fuel tank sits in front of the engine on the left side, and the radio gear and servo tray balance the truck's weight on the right. The 2mm-thick servo tray is made of the same 6061 aluminum as the chassis, and the radio box just behind it houses the receiver and a 4-cell battery holder.

DRIVE TRAIN. Just like an 1/8-scale buggy, the SUT has front, center and rear differentials. The six-gear bevel-type sealed diffs come factory-filled with grease. Since the diffs are completely sealed, they can be filled with optional silicone diff oils of varying weights to fine-tune the diff action. The center diff's 54-tooth spur gear is spun by the engine's 13-tooth clutch bell. Steel dogbones extend from the center and rear diffs, and the front diff spins universal axles to give the SUT full-time 4WD. All of the drivetrain components glide on metal-shielded ball bearings. To bring this rippin'-fast truck to a halt, two vented-steel rotors are connected to the center diff's outdrives; the brakes sit between padded calipers that provide more progressive braking. A brake on each side of the center diff allows the adjustment of front and rear brake bias; that's a necessary tuning tool for racing.

ENGINE AND ACCESSORIES. The SUT is equipped with GS Racing's R25MT (.25-size) engine, which is one heck of a powerhouse. To squeeze out as much power as possible, the ABC-constructed rear-exhaust mill comes with a slide carburetor, a large, blue-anodized, 10-fin cooling head, a round-port header and a tuned pipe. A snorkel-type air filter with an external plastic sheath protects the carb from dirt and grime that might harm the engine. The 125cc fuel tank sits just in front of the engine on the left side of the chassis; a spring-loaded cap and internal stone filter help keep debris out of the fuel line. Although the fuel line is preinstalled, it would be a wise option and cheap insurance to add a $5 fuel filter. Both the throttle and brake linkages were set spot-on by the factory.

SUSPENSION AND STEERING. Four, large-diameter 1/8-scale boingers handle the bumps and jumps for the track-ready SUT. The top-filled shocks are outfitted with super-stiff springs for just about any application. The shock shafts also come with boots to keep dirt out. Ultimately, this keeps the shock-shaft movement as smooth as possible.

The wide front and rear shock towers are made of 3mm-thick 6061-T6 aircraft-grade aluminum that's known for its light weight and strength. Multiple mounting holes in the towers and beefy lower suspension arms allow different shock-mounting options; it's a breeze to fine-tune the suspension for various surfaces. One of the SUT's user-friendly features is that the suspension arm's inner hinge pins are held in place by setscrews that screw into the front and rear pivot blocks (rather than by the more commonly used E-clips). This ensures that the hinge pins won't work their way loose during a bash session or a race.

Upper turnbuckles allow adjustments for front and rear camber, and the front lower turnbuckles let racers alter the front toe to change steering. A standard dual-bellcrank steering system with an aluminum drag link rotates on plastic bushings to provide proportional steering. A built-in, heavy-duty servo-saver on the right bellcrank protects the steering servo.

BODY, WHEELS AND TIRES. A factory-finished body with an intricate flame paint job sits atop the SUT. Since the body sits nice and low, all of the hardware is concealed for a very clean look. The precut, screen-printed body comes with all of the decals applied. The included, large, 6-inch Road Ripper tires have a V-type directional pattern. They're glued to white, one-piece, split 5-spoke wheels and are supported by foam inserts for a plush ride. The wheels are keyed to 17mm wheel hexes that are standard for 1/8-scale buggies, but they can easily be changed (by removing the plastic adapters) to accommodate the more popular 14mm hexes used for "Maxx-size" tires.

INCLUDED ELECTRONICS & ACCESSORIES

GS RACING B-T1 FM RADIO

The GS Racing B-T1 FM radio is a 27MHz 2-channel unit that offers a few handy features. The transmitter has servo-reversing for both the steering and throttle functions, and

you'll find six dials for adjusting steering and throttle trims and steering and throttle endpoint adjustment (EPA) to the left of the steering wheel. EPA is especially helpful for dialing in throttle and brake linkages

GWS S03T STEERING SERVO

The S03T steering servo boasts 75 in.-oz. of torque at a transit speed of 0.20 second with 6 volts. The rosin-geared servo is appropriate for most applications where tight corners and aggressive steering aren't important.

GS RACING GS-9010 THROTTLE SERVO

The GS-9010 is a standard servo that works really well for the SUT's throttle and brake duties. The 52 in.-oz. of torque has a transit speed of 0.15 second. That's plenty of power to open up the engine's slide carburetor and is just the right amount to clamp on the brakes to stop the super-fast truck.

TOOLS

The SUT comes with four hex wrenches, but most of the truck's fasteners are Phillips-head screws. A four-way wrench is included for removing tires, a glow plug and any of the truck's various nuts. The SUT comes with several preload collars for adjusting the ride height, and a transponder mount.

you'll need

- Fuel (preferably 20% nitro)
- 12 AA batteries
- Glow igniter

factory options

- Pro chassis—item no. GS-UTP06
- Pro shock towers (2)—GS-UTP03
- Pro conversion kit—GS-2007
- Carbon-fiber stuff
- Servo tray—GS-UTP04
- Center-diff support plate—GS-UTP01

THE COMPETITION

MANUFACTURER/CAR	ENGINE	TRANSMISSION	REVERSE	SHOCKS	WHEELBASE	STARTER	RADIO	PRICE*	REVIEWED
Associated Monster GT	.21	2-speed	Yes	8	14.5 in. (368mm)	Pull/shaft	Associated	$499	12/03
GS Racing SUT RTR	.25	Single-speed	No	4	12.8 in. (325mm)	Pull-starter	GS B-T1	$460	6/04
HPI Savage 21	.21	2-speed	No	8	13.25 in. (336mm)	Pull-starter	HPI	$429	12/02
Kyosho Mad Force RCX	.21	3-speed	No	8	12.5 in. (318mm)	Pull-starter	Not Included	$469	10/03
XTM Mammoth	.247	2-speed	No	8	15.51 in. (394mm)	Pull-starter	Hitec Lynx	$400	02/04

*Partial list; category is too large to include all competitive vehicles. *Approximate; price varies with dealer.*

SPECIFICATIONS

MANUFACTURER GS Racing
MODEL Storm Unlimited Truck SUT
DISTRIBUTED BY GS Racing
SCALE 1/8
PRICE $450
Varies with dealer

DIMENSIONS
Wheelbase 12.6 to 12.8 in. (320 to 325mm)
Width 13 in. (330mm)

WEIGHT
Total, as tested 144 oz. (4,100g)

CHASSIS
Type Stamped plate with radiused mudguards
Material 3mm 6061 aluminum

DRIVE TRAIN
Type Shaft-driven with three differentials
Primary 54T spur/13T clutch bell
Transmission ratio 3.31:1
Final drive ratio 13.74:1
Drive shafts (F/R) Universal/dogbones
Differentials Grease-filled, bevel geared
Bearing type Metal-shielded

SUSPENSION
Type Lower A-arm with adjustable camber link
Shocks Aluminum-body with Teflon shaft guides and bladder seal

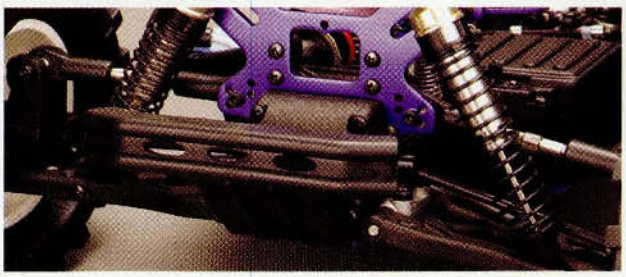
WHEELS
Type White, one-piece, split 5-spoke with 17mm hexes

TIRES
GS Road Ripper with a V-type tread pattern

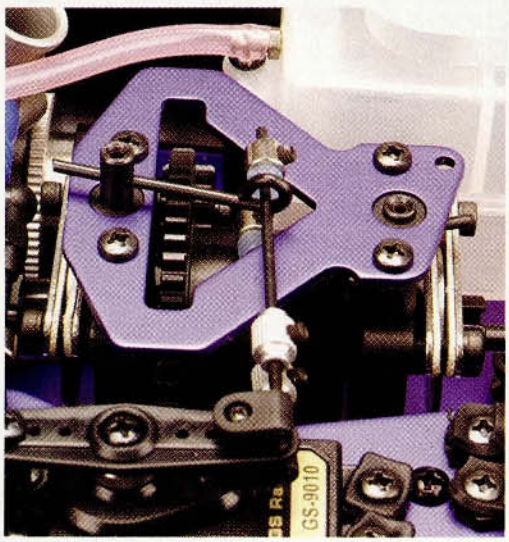
ENGINE AND ACCESSORIES
Engine GS Racing R25MT rear exhaust with pull-starter
Carburetor 2-needle slide
Exhaust Round-port header attached to tuned pipe with a silicone coupler
Fuel tank 125cc

The radio box that houses the receiver and batteries opens easily; just remove one body clip. The large box has room for a rechargeable NiMH receiver pack if you decide to upgrade.

Long blue-aluminum axle adapters are used at all four corners to make the SUT as wide as possible. The 1/8-scale shocks keep the truck rolling through the roughest terrain.



Left: extra-beefy front and rear bumpers help keep the SUT in one piece when it tangles with obstacles.



Left: here's a good view of the SUT's center diff. That's a steel gear poking through the top plate, and you can see the front and rear steel disc brakes that flank the diff. Note the knurled barrels on the brake linkages for easy bias adjustments.

Right: the R25MT engine is responsible for making the SUT scream at more than 40mph. A 10-fin anodized-blue aluminum cooling head keeps the engine's temp down, and the round-port header and tuned pipe expel the exhaust.

PERFORMANCE

During the initial break-in, I noticed that the engine's idle adjustment was a little high, so I backed the screw out about two turns so the truck wouldn't move when it was in neutral. I ran the SUT with the blubbery-rich factory settings for about five tanks of fuel then began to lean out the bottom- and top-end needles. With the engine tuned, it was time to jump the SUT off anything that got in its way. Curbs didn't even cause the suspension to flinch; the truck landed off them without any sort of drama. The suspension soaked up landings as if the truck were driving on clouds. I decided to launch the SUT off my front yard and into the street—about a 4-foot drop. The truck bottomed out when it landed, but it maintained its composure and made the same jump over and over. On asphalt, the Road Ripper tires provided excellent traction; so much traction—in fact, that I managed to traction-roll the truck a few times.

It was time to take the SUT to play in the dirt. I headed to one of Southern California's hottest nitro off-road tracks, KZ Speedway in Sun Valley, CA. After driving conservatively for few sighting laps, I jumped it over big doubles and long tabletops. The truck was surprisingly agile and fast enough to clear jumps that usually only 1/8-scale buggies can clear.

LIKES

- The SUT is superfast.
- Engine starts with a single yank and has tons of power.
- Plush suspension handles the rough stuff well.
- Can be raced right out of the box.

DISLIKES

- Steering servo is a little under-powered.

The SUT's brakes were set perfectly from the factory. I lowered the nose and perfectly downsided the jumps by tapping on the brakes. A run down the large 200-foot back straightaway required serious clamping force to bring the truck to a halt before a 180-degree turn at the end of the straight. The brakes performed well, and throughout several tanks of testing they never faded. The only sections of the track that presented any problems were the hairpin 180-degree turns. The steering servo struggled a bit to hold a tight line, so I had to bring the truck into the corners hot and slam on the brakes to get through the tight turns with any speed. I noticed the SUT could hang with race-prepped buggies on the straightaway, but it outshone the monster trucks, regardless of which engines powered them. I called it a day after running through a number of tanks. The SUT proved itself more than capable as a monster truck racer.

THE VERDICT

The SUT will make a great backyard basher, but this monster really shines when it's on the track where it can take on double jumps and whoops without skipping a beat. The R25MT engine is the truck's best feature because it runs like a Swiss watch and produces sick power.

Out of the box, the SUT is ready to tackle just about any terrain, and there really isn't a need for upgrades, but GS Racing does offer quite a few carbon-fiber hop-ups and other goodies for making the SUT totally trick. If you do plan to race it, you'll want to install a high-torque steering servo that will help the truck in tight turns. After going through several tanks of fuel for break-in and several more tanks of bashing as well as spending a full day at a track, I can honestly say that the SUT receives my highest recommendation to any monster-trucking enthusiast.

RATING THE GS RACING STORM UNLIMITED TRUCK

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
INSTRUCTIONS	Presentation could be better, but all the pertinent information is there.				
INCLUDED ELECTRONICS	The steering servo is a little under-powered, but the radio has good range and helpful endpoint adjustment dials.				
PARTS FIT & FINISH	The SUT is well built, and all the parts look pretty good.				
ACCELERATION	The GS R25MT engine gets the truck up to speed very quickly.				
CORNERING ABILITY	You can push the SUT hard in the corners, but the steering servo has a tough time keeping the wheels cranked.				
BUMP & JUMP HANDLING	The suspension floats over bumps and handles jumps exceptionally well.				
DURABILITY	The SUT held up to some serious abuse, but check for loose screws after an intense off-road session.				

RADAR TESTED TOP SPEED 41MPH* **BEST BUYER** Any nitro moster fans; racers in particular.

* *Top speed varies with equipment used.*

TEST GEAR

Team Orion Black Demon 20% Nitro Fuel

Team Orion Black Demon 20% Nitro Fuel is clear and clean burning. The engine started every time and ran flawlessly throughout my tests. Anti-foaming agents prevented the fuel from foaming, and Team Orion claims that the "wetting agent" used in the fuel helps lubricate the bearings and should ensure a long engine life.

SOURCES

GS RACING (626)-338-3815, gsracing.com.

TEAM ORION (714) 694-2812; team-orion.com.

by Matt Higgins

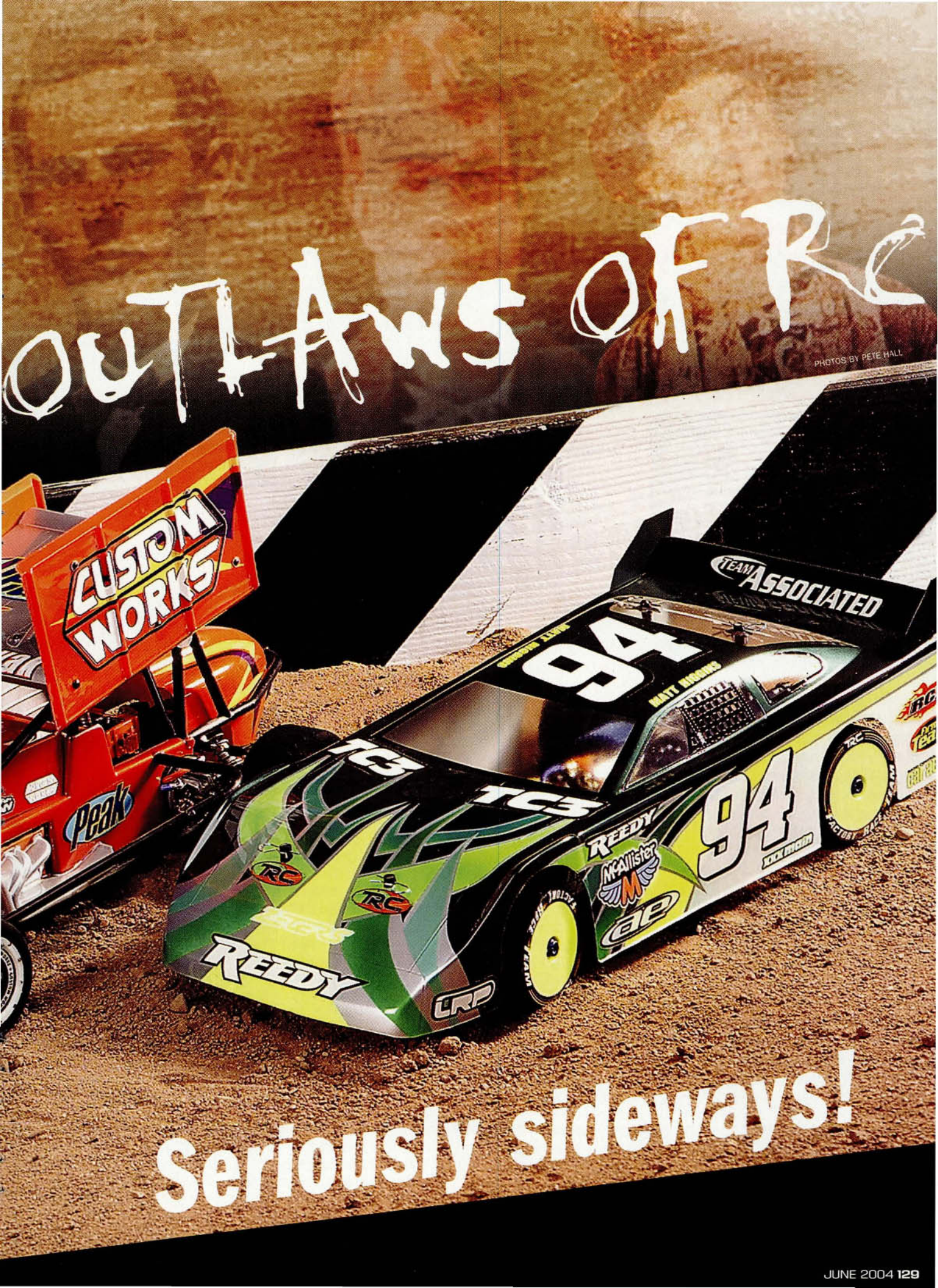
If you aren't racing dirt oval, you're missing out on some of the most thrill-filled, wheel-banging, dirt-slinging racing action there is. RC dirt-oval racing has a long history and enjoyed *huge* popularity in the early days of RC competition. Now it's on the rise again and in a big way, with a big-time, full-size racing star helping to launch dirt oval back to the status it enjoyed in its glory days. In a surprising move that will no doubt provide an awesome boost to the scene, 2002 NASCAR Nextel Cup champion Tony Stewart has purchased Custom Works—a company that has a legacy of winning races that dates as far back as organized RC dirt-oval racing itself.

To help you get a handle on this unique type of racing, I brought together the three main types of specialized dirt oval machines: an Eastern dirt modified car (EDM), a full-fender late model and a winged sprint car. You might be surprised by what's under the hood of these dirt-oval racing machines.

DIRT OVAL:

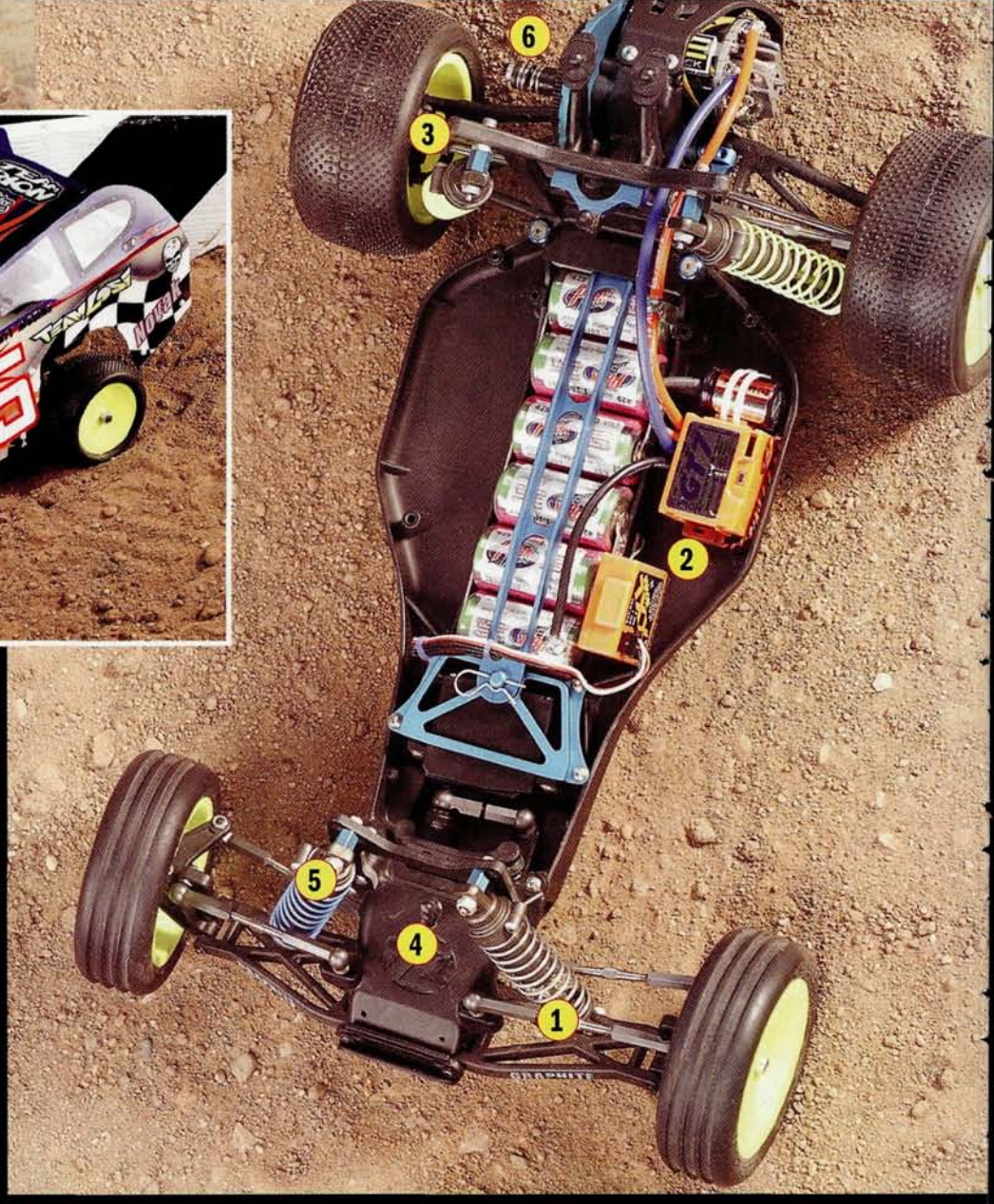
outlaws of RC

PHOTOS BY PETE HALL



Seriously sideways!

Many EDM racers carefully cut and fold sheet Lexan to make their own bodies, but McAllister Racing makes this far more realistic (and convenient) shell. The side and roof sections are still made out of sheet Lexan, but the inner section is a more traditional vacuum-molded piece. Zegers RC Graffixx whipped up the awesome paint job.



EASTERN DIRT MODIFIED

These wild-looking machines are favorites among current dirt-oval racers, and at some races, their numbers rival those of the sprint cars. With their open-wheel design, serious on-track action is inevitable, and the smaller the track, the more intense and insane the competition gets. My EDM is just a slightly modified Losi Triple-X buggy. Purpose-built dirt-oval chassis are available for this class and so are conversion kits such as the Custom Works Intimidator 10; but on less-than-perfect, bumpy tracks, a converted buggy can more than hold its own and is often the vehicle of choice. At most tracks, they have two classes of EDMs—one for gearbox-equipped cars like our Losi and the Custom Works Intimidator 10 and another class for direct-drive cars like the regular Custom Works Intimidator kit. As in other types of racing, these two classes are further broken down into stock and modified (power) categories.

1 **CAMBER SETTINGS.** The base setup for the Triple-X is great on any dirt track, including dirt ovals, but because we're only turning left, we can make a few tweaks. The camber on the left front wheel is set at -3 degrees. The tighter the track and the harder the car corners, the more camber you need. The spring at this corner is also the stiffest of the four.

2 **LEFT BIAS.** Oval cars work better with as much weight on the left side as possible; this is referred to as a "left bias." Although repositioning the battery would work best, I wanted this buggy to be able to return to normal off-road duty, so I just moved the Novak XXL receiver to the left side with GT7 ESC and left the pack centered on the chassis.

3 **REAR STEER.** I race this EDM on a very small, tight track. To help it get around the corners, I dialed in "rear steer." To do this, I left the rear hub in its most rearward position and the right rear hub in the middle position. If I want the car to come around even more aggressively, I'll move the right rear hub all the way forward. Another way to get more aggressive steering is to set the car up with 1 or 2 degrees of toe-out. This makes the car less stable going down the straight, but it will turn into corners with much more authority.

4 **BODY MOUNTS.** With a little creative trimming, the McAllister EDM body fits the Losi's stock body mounts perfectly. The rear of the body clips to the wing mount, and the front slips underneath the shock tower and onto the front body mount.

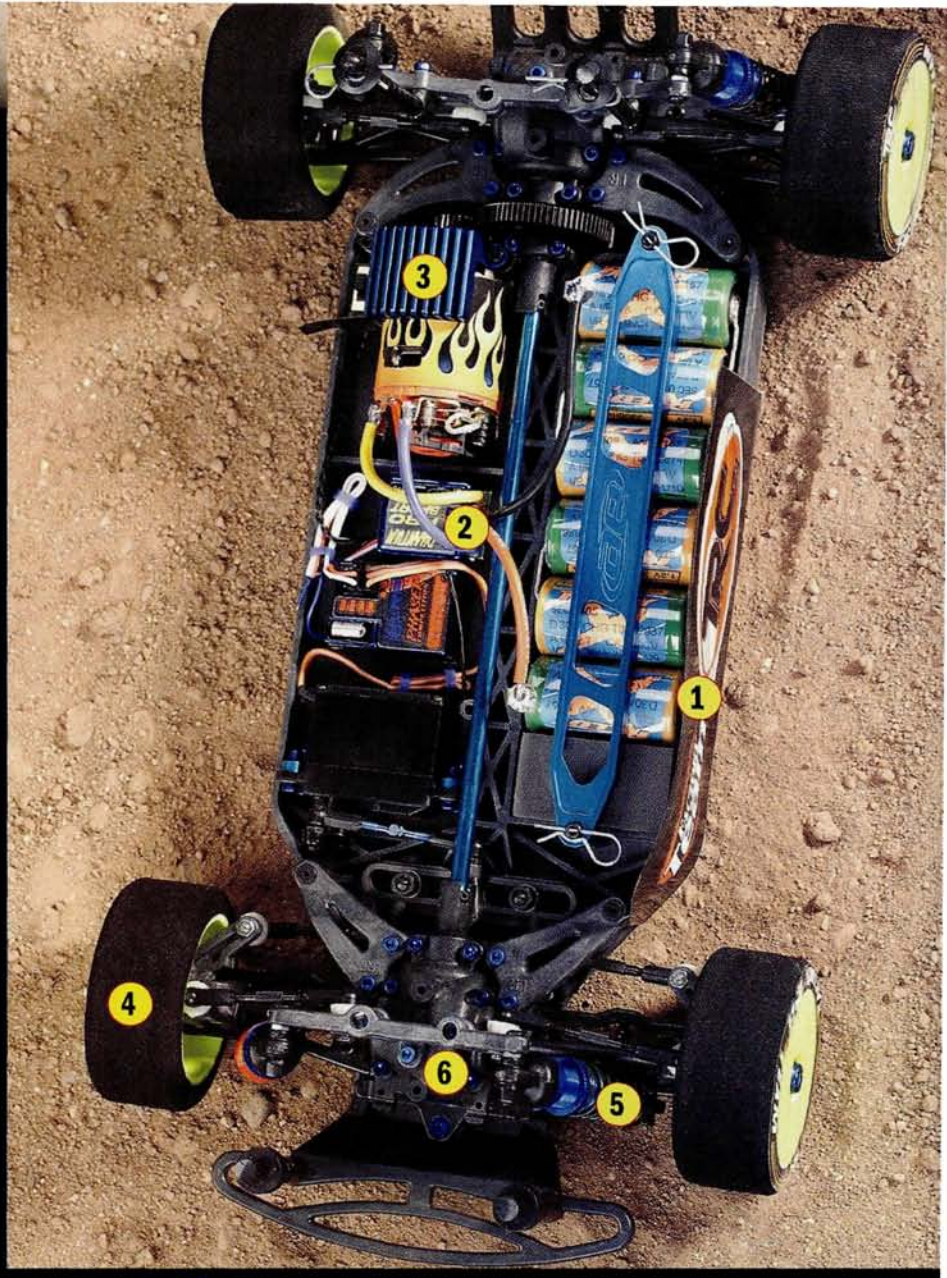
5 **RIDE HEIGHT.** This EDM sees action on a relatively rough, tight track. If your track is smooth, you can try slamming the car down any number of ways. The best and, unfortunately, the most time-consuming method is to insert spacers inside the shock and on the shock shaft below the piston. You can also lay the shocks down by using the outermost holes on the arms and the innermost holes on the shock tower, but this will affect the car's handling. Many racers fabricate new shock towers and use touring-car-size shocks or front buggy shocks all the way around.

6 **SLIPPER SETUP.** To improve the Triple-X's acceleration out of the corners, tighten the slipper almost completely. Racers often run without any slipper on tracks that offer consistently high traction.

Zegers RC Graffixx was again called into action, and I chose another body from McAllister Racing—the Hagerstown late model. Another good shell that's worth checking out is Parma's Oval Outlaw. Both bodies are 200mm and fit gas and electric touring cars. If traction is lacking, a Lexan side dam can be added as long as the car's overall height doesn't exceed 11 inches (says ROAR rules).

LATE MODEL

This is the real surprise of the group. My late-model car is a Factory Team TC3 with Associated's rally car conversion. The result is a completely tricked out and dialed late model. You could opt for a purpose-built car, but this late-model setup gives up nothing to the competition. With its sealed drive train and durable shaft drive, it's a natural. The rally conversion stretches the TC3 out to a 200mm-wide stance, and the longer shock shafts bump up the suspension travel. If you want to race in the late-model class, this is the setup you need to find victory lane, but even a standard TC3 can work well; just unscrew each shock eye a few turns to increase suspension travel for the bumpy sections.



1 DIRT SHIELDS. With all four wheels going, this late model tosses a serious amount of dirt around. To keep as much of it out of the car as possible, I taped a Lexan shield to the left side of the chassis. Another small shield in front of the on/off switch prevents it from getting fouled with dirt. Also note that the switch is mounted in the far right/rear corner and as far away from the flying stuff as possible. I dressed up the Lexan with carbon-fiber sticker material from XXX-Main Racing.

2 SPEEDO. With its Adjustable Power Control (APC), the LRP Quantum Pro Sport is the perfect choice for this dirt-oval machine. Just as in full-size dirt-oval racing, track conditions can change drastically during a night of racing; the previous round's traction can vanish and leave your car spinning out in the corners. Before I take to the drivers' stand for my Main, I take one hot lap, and then, if I need to, I quickly adjust the APC with a turn of a screwdriver. More than once, this speedo made the difference between holding my own and barely holding on.

3 MORE MOTOR. Full-on mod motors have been the hot ticket for 4WD dirt oval cars, but their speeds are a little over the top for most tracks. Stock motors are fine, but these cars can handle more power. The new crop of 19-turn motors provides the perfect balance. I selected the new Reedy Spec 19, which, with its cool flame motif, won me over on looks alone. Reedy's new mill has laydown brushes, Quad-mag technology, adjustable timing, ball bearings and more than enough power to get this car sideways.

4 CUT TIRES. The tires of choice for the late model are foams from Trinity's TRC line. TRC includes self-adhesive sidewall protectors that really help these soft tires to withstand the abuse that dirt tracks dish out. In front, I went with 26mm-wide tires, and in the rear, 28mm tires. If the car pushes, I might put a 26mm tire on the left rear. To increase forward bite, I used a sharp hobby knife to cut slashes across each tire.

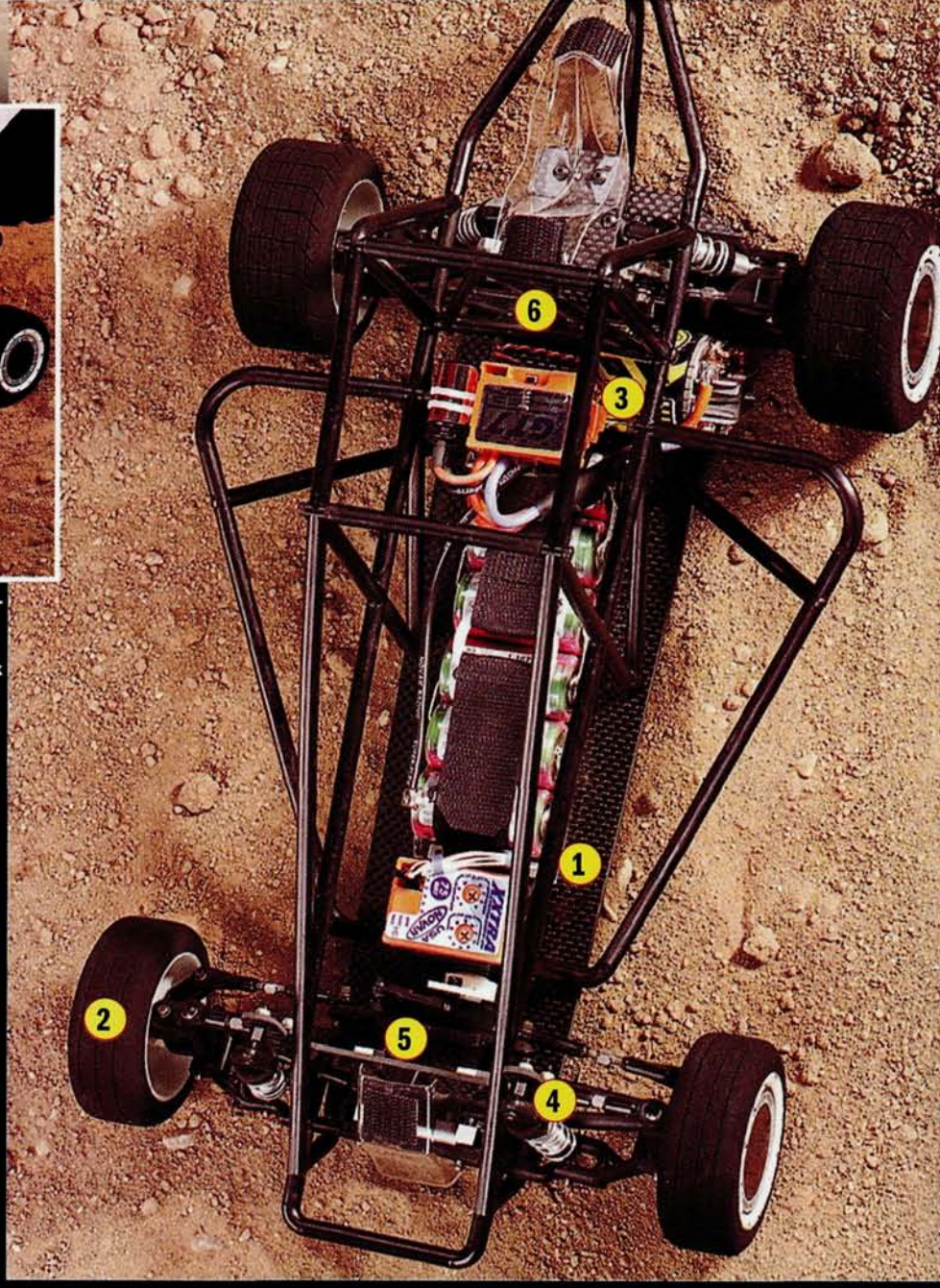
5 SETUP TRICKS. Like most oval cars, the late model works well with a stiff right front spring. It prevents the front from digging in too much during hard cornering. To help the car come off the corners well and not push into the wall, I use a soft left front spring. If the car still pushes, I install a stiffer right rear spring. I set right front camber at -5 degrees and the right rear at -2 degrees. On the left side (front and rear), I almost always start with zero camber and dial in positive camber, according to how the tires are wearing. If the insides of the tires wear faster than the outsides, I dial in 1 or 2 degrees of camber.

6 TWO DIFFS. Both of the gearboxes on this TC3 are equipped with ball differentials, but many other setups are possible. In addition to the obvious front-one-way setup, try a spool in front, or, for ballistic acceleration, bolt a spool into the rear diff and use a one-way in front.

The Enforcer's body comes in pieces that, when assembled, make for one slick-looking, realistic sprinter. The two side panels have header-pipe details, and the left side has a molded-in starter motor. Zegers RC Graffixx did the painting, and I added the popular Custom Works Speedway hood to increase front downforce. Custom Works offers a ton of other cool bodies you can check out on its website.

SPRINT CAR

Sprinters are the quintessential dirt-oval cars; with their open-wheel design and huge wings, they just scream "Action!" Here's a Custom Works Pro Comp Enforcer chassis that has probably won more RC sprint car races than all the other designs put together. This direct-drive car is an absolute rocket. Though direct drive is more common, there are also classes for gearbox-equipped sprinters. Custom Works offers a conversion called "Enforcer 10" that will convert an old-style RC10 into a sprinter; but that setup is now out of date and is being replaced by a new gearbox kit—the Enforcer GBX—that's based on the much more current Team Associated B3. This new car will be offered as a complete kit and not as a conversion. For EDM fans, an Intimidator GBX will also soon be on hobby-shop shelves.



1 THE CAGE. The Enforcer has a sturdy nylon roll cage that is mounted on a flat graphite chassis. I dyed the cage pieces black using Rit clothing dye (we keep finding more RC uses for this!). The cage arrives in several pieces, and the completed setup is relatively strong, but resist the temptation to crank all of the hardware down extra tight because if you do, you'll risk breaking it or tweaking the chassis. A wrap of electricians' tape hides the metal turnbuckles that connect the tail section to the main cage.

2 FAST FOAMS. I set the Enforcer up with foam tires, which are generally the hot setup at most tracks. Foam tires offer tons of grip and weigh less than rubber tires. The reduction in rotational mass is instantly noticeable on the track. The tires' tread pattern further increases traction, and Custom Works offers tires in a variety of compounds. The stick-on wheel discs really finish off the rims and give them a real dirt-oval look. The front wheels spin on supersmooth ball bearings.

3 MOTOR AND BATTERIES. Sprint cars are well known for being over-powered, and this sprinter lives up to that reputation with a Team Orion dyno-tuned Core Stock RS motor and some very nasty Peak Racing PowerFlo batteries. The voltage on these things is just incredible. To keep the front wheels on terra firma at least some of the time, the Enforcer's motor is mounted in front of the rear wheels in the mid-chassis position.

4 4-WHEEL INDEPENDENT SUSPENSION. Unlike a full-size sprint car, the Custom Works car has 4-wheel independent suspension. A solid rear axle might have been more true to scale, but the Enforcer is a racing machine more than a model, and out on the track, the design speaks for itself. Aluminum, threaded-body shocks are at each corner; Custom Works' new GBX cars will feature larger touring-car-size shocks.

5 PRECISION STEERING SYSTEM. Instead of the bell-crank setup used in many RC cars, the Enforcer has a rack and sliding arm system that is slop free and, as a result, very precise. Since there isn't a servo-saver, I added a Kimbrough unit to the servo. Up front, I can adjust caster by switching mounts. The range of adjustment is from 15 to 25 degrees in 5-degree increments. If you have a hard time keeping a handle on the car while it's going down the straight, try 25 degrees of caster. Just keep in mind that this sprinter will really push coming off the corners.

6 DIRECT DRIVE. The Enforcer's direct-drive system is super-efficient and incredibly fast. The diff accepts standard spur gears, and you can use 48- or 64-pitch gears. The motor is mounted in front of the rear axles on a machined-aluminum mount, and the two sides of the diff housing have the shock and suspension arm mounts machined in. The fit and finish on these and all Custom Works pieces are truly first-rate.

Gettin' sideways

You've seen the hardware. Are you ready to go racing? Here are some hot sites to satisfy your dirt-oval jones until Sunday.

DirtOval.com: this is the premier site for dirt-oval dudes; it covers a comprehensive list of subjects, and its message board sees a lot of traffic. There is also a great link to other dirt-oval links that are worth checking out.

RCCarAction.com: in addition to links to all the sites described here, you'll find a complete track directory to help you find a dirt oval track near you.

McAllisterRacing.com: no company is more committed to dirt-oval bodywork than McAllister. From late models to sprint cars, they're all here.

Worldofoutlawsracing.com: this is the official site of the World of Outlaws series. If you want inspiration for your sprinter, check out this site devoted to the full-size racecars.

CONCLUSION

If you want to do something fast, fun and different with RC, get into dirt oval. No dirt oval nearby? No problem. A dirt-oval track can be incorporated into almost any off-road track. You don't have a specialized dirt-oval car? You don't need one. If you have an off-road car and can turn left, you can race dirt oval (but once you get hooked, you're sure to build a left-turn-only rig!). So now there's no excuse; see you at the track, and get sideways!

SOURCES

CUSTOM WORKS
(704) 489-8147;
customworksrc.com.

LRP distributed by Team Associated.

MCALLISTER RACING
(928) 714-1799;
mcallisterracing.com.

PARMA/PSE
(440) 237-8650;
parmapse.com.

PEAK PERFORMANCE
(714) 692-8533;
peakmotors.com.

REEDY a division of Team Associated.

TEAM ASSOCIATED
(714) 850-9342;
teamassociated.com;
rc10.com.

TEAM LOSI distributed by Horizon Hobby Inc.
(800) 338-4639;
teamlosi.com;
horizonhobby.com.

TEAM ORION INC.
(714) 694-2812;
team-orion.com.

TRC (732) 635-1600;
teamtrinity.com.

XXX-MAIN RACING
(877) 744-6793;
xxxmain.com

ZEGERS RC GRAFFIXX
(561) 988-5411;
zegersrcgraffixx.com.

RACER NEWS

BY THE RC CAR ACTION TEAM

OFNA LD3 WINS BIG IN TAIWAN

Every year, shortly after the Chinese New Year (January 22), a very prestigious race is held at the Silver Stone Racing Track in Taiwan. This year, teams from Serpent, Associated, Team Magic and OFNA competed for the crown. OFNA's LD3 was the car to beat; it took the TQ and then the top three spots in the grueling, 45-minute A-main final. According to OFNA, it was the first time any manufacturer has swept that race.

RICHARD SAXTON JOINS TEAM PRO-LINE

Richard Saxton will be running Pro-Line tires this season. The 1/8-scale, off-road ace will race his new Thunder Tiger buggy, the X-Factor, at all the major 1/8-scale off-road races. According to Pro-Line's Scott Hughes, "We're really happy to have Saxton on our team. Not only is he fast, he's also a good guy for our sport."

SITE SEEING

Frequency-rc.com

Frequency RC has pretty good home footage of 1/8-scale on- and off-road cars ripping up asphalt and the dirt. The videos are only a couple of minutes long and are easy to download. The site also has a gallery of several cars, and you can download cool RC wallpaper for your desktop. The site is updated frequently, so check back often!

BOARD WALK

FROM THE RADIOCONTROLZONE .COM BULLETIN BOARD

Stock motor break-in

JME3: What is the best way to break in a new stock motor?

IXXLAMBOFGODXXI: You don't really need to break in your stock motor.

WVRACER: I think it is very important. I run my motors at 3 volts for 5 minutes. It allows the brushes to seat properly.

Nitro questions

JMM: Is it best to run an engine until it runs out of fuel, or can I just stop it? Should after-run oil be used after each run or only when you've finished for the day and are going to store your car for a while?

HPICASPER: I always run my engine until it runs out of fuel. When you've finished for the day, put a few drops of after-run in the carb and in the glow-plug hole. Then, give your pull-starter a full pull without the glow igniter on.

LOSIGUY1090: Run it till it runs out of fuel—and just at the end of the day.

Steering weak?

SUPRAPIMP22: I just installed a high-torque steering servo, and it didn't seem to help. My car still steers really slow. Is it my batteries?

ROCKNBIL: My vote goes with the pack not reaching peak—and possibly forming a memory.

JOEMAXX: I don't think you're charging the pack long enough. When buying a charger, you need to find out whether it can charge 5-cell hump packs.

BE HEARD! LOG ON AT RADIOCONTROLZONE.COM

SIN CITY SHOWDOWN

The Silver State Nitro Championship is held annually in Vegas, and it's one of the biggest nitro 1/8-scale and 1/10-scale off-road races of the year. Mugen/Pro-Line drivers Chad Bradley and Scott Hughes battled with Kyosho/Pro-Line driver Mark Pavidis for the entire 45-minute 1/8-scale Buggy A-main. Hughes led early in the race, but Bradley edged out his Mugen teammate by just 0.3 second for the win; Pavidis secured the third spot. In 1/10-scale Truck, Adam "The Drake" won with his Trinity-powered Team Losi Triple-XNT with Team Associated's young ace Jared Tebo and Team Losi/Trinity driver Ryan Cavalieri close behind in second and third.

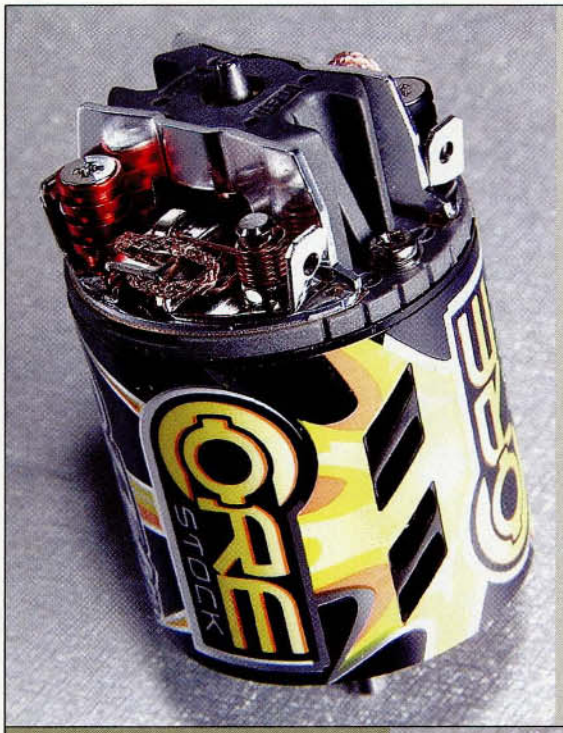
STATIC-X KICKS IT WITH AE

Because Team Associated's Tony Phalen was wearing an Associated shirt at one of Static-X's shows, the band picked him out from a group and told him they were big RC-heads. Tony invited the group over to Team Associated to hang out and get some wheel time. The Static-X guys drove Monster GTs and B4s in the AE parking lot, and band members took turns shredding the asphalt with high-speed runs and power slides. Just after their visit with Team Associated, the band headed to Australia to tour with Korn and Fear Factor. You can check them out online at Static-X.com.

"When you get to hang with rock stars you feel like one!"

Team Associated's Tony Phalen on his Static-X encounter.

SPEED SHOP



TEAM ORION

Core Stock RS 27-turn rebuildable motor

Orion's new motor features a dual stack "Power Tunnel" armature that has high-rpm characteristics. When it's coupled with Orion's all-new, super-strength G12 wet magnets, the guys at Orion claim that it delivers maximum torque and rpm while still maintaining high efficiency. The motor also comes with installed surface-mounted capacitors. The speed-treated version comes with a precision diamond-cut commutator, special brushes, zapped magnets and treated bushings. An included dyno-test printout will help establish gear ratios and determine the motor's power output.

Team Orion Core Stock RS 27-turn rebuildable motor (regular/speed treated)—20020/20021; $30/$40.
Team Orion Inc. (714) 694-2812; team-orion.com.

ZUBAK'S SPEED JUICE

Speed Juice & Speed Lube

According to Zuback, Zubak's Speed Juice comm drops have powered racers to five national titles in the past two years! The drops are formulated for use in 4- and 6-cell stock-class racing, and Zubak claims that if you aren't completely satisfied with the Juice, they will work with you to figure out what's wrong or your money back. Zubak's Speed Lube Micro Bearing Oil is formulated just for—stay with me now—bearings. According to Zubak, two to three drops per bearing are all it takes to make a noticeable improvement in performance.

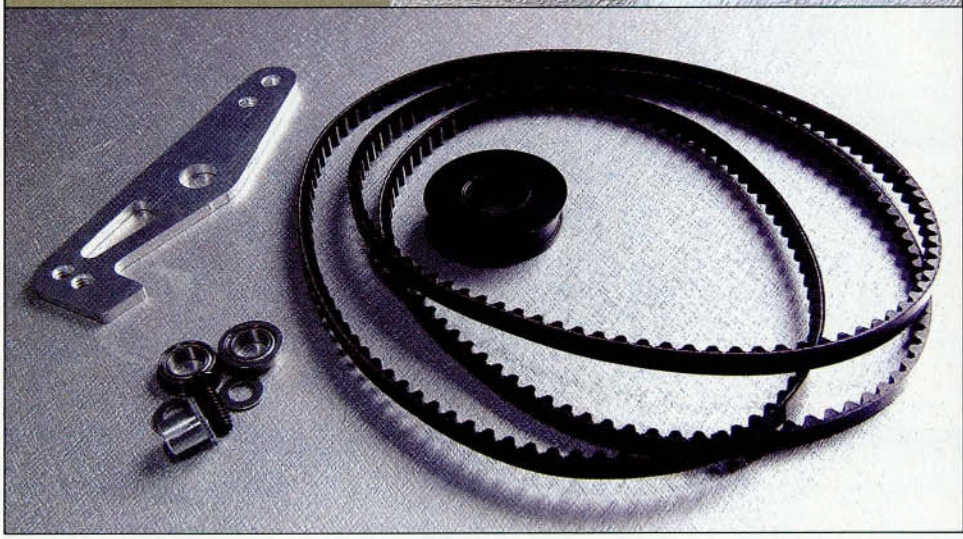
Zubak's Speed Juice/Speed Lube—00100/00200; $8/$6.
Zubak's Speed Juice (248) 703-0322; speedjuice.com.

FACTORY TEAM

Servo mounts

Factory Team has new, blue-anodized aluminum servo mounts that are stronger and more secure and allow precise servo mounting. They fit Team Associated's RC10B2, B3, B4, T2, T3, T4 and GT. The mounts also fit the Nitro TC3 and the electric TC3.

Factory Team servo mounts—1779; $16.
Factory Team; distributed by Team Associated (714) 850-9342; teamassociated.com.



TEAM LOSI

Heavy-Duty Belt Kits

Team Losi now offers enhanced, heavy-duty drive-belt systems for its Triple-X4 and Triple-XS. After extensively testing different belts, Team Losi found that the new belts skip less even though they're actually set to run looser than the stock belts. A loose belt provides less rolling resistance, and less skipping and rolling resistance translates into better acceleration and increased run time. The Heavy-Duty Drive Belt Kits include a belt as well as a new, stiffer tension arm and machined idler pulley with dual ball bearings. The kit takes only a few minutes to install, and according to Team Losi, the results are immediately noticeable.

Team Losi Heavy-Duty Drive Belt Kit (Triple-X4)—LOSA3277; $20.
Team Losi Heavy-Duty (long) Drive Belt Kit (Triple-XS)—LOSA3280; $20.
Team Losi; distributed by Horizon Hobby Inc. (800) 338-4639; teamlosi.com; horizonhobby.com.

SPEED SHOP

TRINITY

Trinity Nitro Power Platinum blend fuel

Trinity's Platinum blend fuel was used by Team Sirio/Kyosho to capture the 1/8-scale On-Road World Championship title in 2003, and it's the only fuel endorsed by Sirio. According to Trinity, the fuel uses de-gummed castor and anti-rust agents that help keep an engine free from sludge and rust when it isn't running. Platinum blend is for the more experienced racer because it has an aggressive blend of 10-percent oil. This produces maximum power but isn't as forgiving for tuning as the Monster Horsepower blend or Monster Brew. It comes in a steel can and a plastic bottle and is available in gallons and quarts.

Team Trinity Nitro Power Platinum blend (qt./gal.)—item nos. vary with nitro percentage; $12 to $14/$32 to $37 each.
Trinity Products Inc. (732) 635-1600; teamtrinity.com.

TAMIYA

Oil Removing Foam

This cool foam hand cleaner quickly and easily removes dirt and grease without water. It's perfect for post-maintenance cleanup; think about how oily your hands are after you work on the shocks! Just spray a ball of foam into your palm and rub your hands together. The foam dries like glue and captures dirt and oil as it sticks. When you roll the dried foam off your hands, they're clean! The can is good for approximately 50 uses, and the foam has a nice citrus smell.

Tamiya Oil Removing Foam—87065; $7.25.
Tamiya America Inc. (800) 826-4922; tamiyausa.com.

REEDY MODIFIEDS

Actron Cavity laydown brushes

Looking to beef up your motor's performance quickly and easily? Well, Reedy now offers replacement laydown cavity brushes. According to Reedy, these brushes are best used in stock and 19-turn motors.

Reedy Modifieds Actron Cavity laydown brushes—770; $4.50/pair.
Reedy Modifieds, a division of Team Associated (714) 850-9342; teamassociated.com.

TRACK THREADS

TAMIYA USA

logo tee

You can't beat a Hanes Beefy-T for comfort and beefiness (duh), and since Tamiya went with black, you can wipe your greasy mitts on the shirt and still wear it to your post-race date (What? You were gonna shower?). Available in small (for your girlfriend) all the way up to 3XL (for your huge self).

Tamiya USA logo T-shirt—$15 (S to XL), $17 (2XL, 3XL)
Tamiya America Inc. (800) 826-4922; tamiyausa.com.

UNDER THE HOOD

Chad Bradley's Mugen MBX-5

RACE: SILVER STATE NITRO CHALLENGE

EQUIPMENT USED

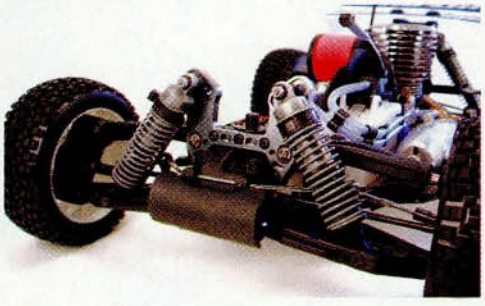
Transmitter: Airtronics M8
Receiver: Airtronics 92836 FM
Steering servo: Airtronics 94359
Throttle servo: Airtronics 94359
Fuel: Sidewinder 30%
Engine: Mugen/Rex P5
Glow plug: Rex no. 6
Tires: Pro-Line Knuckles
Body: Pro-Line Crowd Pleazer
Gearing: 13T/44T

FACTORY & AFTERMARKET OPTIONS

Fioroni
- 3-degree rear toe-in block

Mugen
- Titanium turnbuckles
- CNC aluminum
- —Front and rear chassis braces
- —Front and rear 5mm shock towers
- —Front and rear suspension-pin holders
- —Steering slider

The front end on Chad's buggy is stock, except for Mugen's optional 5mm-thick CNC shock tower and pin braces and the titanium turnbuckles that Chad added to strengthen the front end. Chad uses the stock front swaybar for most tracks.



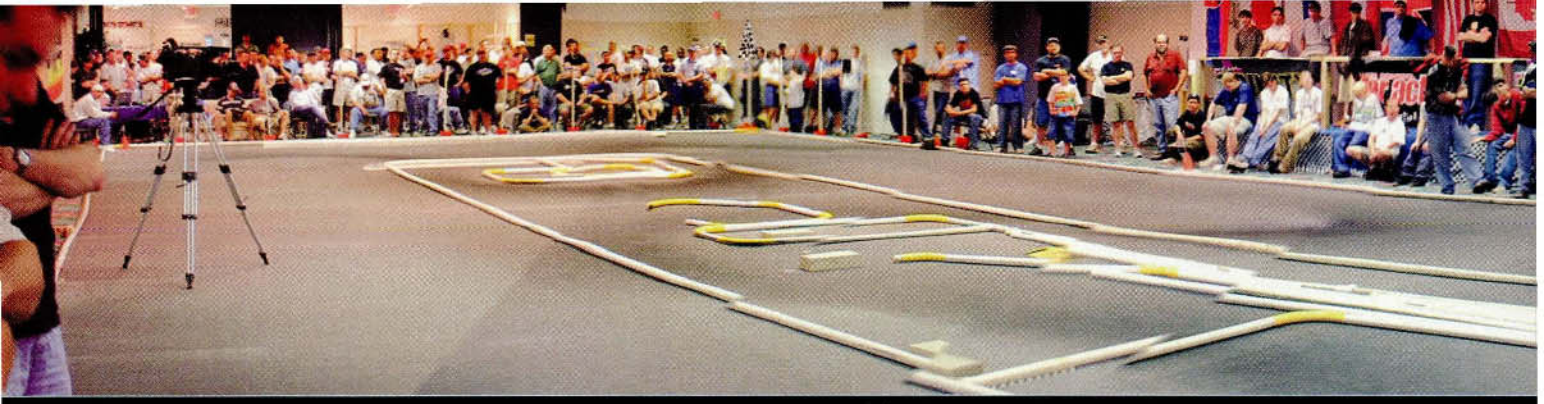
According to Chad, the Mugen/Rex P5 engine isn't quite as powerful as the JP modified version, but it is easy to tune and extremely reliable; don't mess with success. Notice that the manifold is secured to the exhaust port with two springs. "An ounce of prevention," as they say.

A Fioroni 3-degree rear toe-in block replaces the stock molded piece. The suspension pins are secured with a Mugen CNC aluminum-pin brace in front of the rear diff. Check out the 5mm-thick Mugen shock tower. Chad used the stock rear swaybar as well.

FACTORY DRIVER HOT MOD

The exhaust tip is protected with a molded guard. This little gadget is included with the MBX-5, but most racers neglect to use it because holes must be drilled in the mudguard to install it, and the mounting screws that secure the guard tend to bind with most tuned pipes. Chad modified the tip protector slightly and glued it to the mudguard with CA.

PRO-LINE
Pro-Line
Pro-Line
Pro-Line



MIKE BOYLAN'S 10TH ANNUAL SNOWBIRD NATIONALS

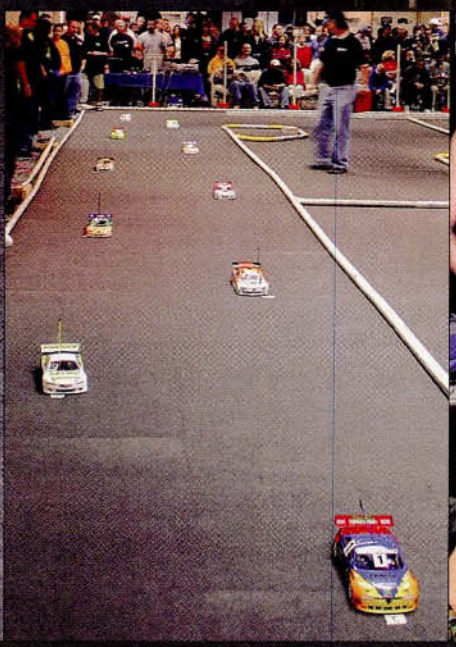
the big one

by Kenny Bergschultz

There are a lot of big RC races each year, but none like Mike Boylan's Snowbird Nationals, held in Orlando, FL. This event goes beyond being just a mere race. It brings on-road and oval contestants together under one roof for a huge, week-long show.

The Snowbird Nationals has become the pinnacle event of RC indoor carpet racing worldwide. Not only does this race unite the best on-road and oval drivers from the U.S., drivers also come to Florida from other RC racing hotbeds such as Japan, Australia and Europe. This race truly is the big one. The 2004 race was the impressive 10th running, and a mind-blowing 780 entrants took over the Ramada Resort! The racing was nonstop with around-the-clock action.

SPONSORED BY TEAM TRINITY • RC CAR ACTION • DODGE MOTORSPORTS



snowbird thanks

Associated Electrics
XRAY
Team Losi
Baddog Racing
Big Dog RC
Cyrul Engineering FX
Competition Electronics
Team Corally
Custom Works
Fusion Power
Gizzmo Racing
GS Hobby
Hot Rod Hobbies
Hurricane Motorsports
Hyperdrive Racing
Irrgang Racing Service
Jaco
Jakes Performance Hobbies
Johns' BSR Racing Tires
Kimbrough Racing Products
KMR Batteries
KSG Motorsports
Maverick Oval Chassis
Mindblown Motors
mdi racing
NORRCA
OnTrack Racing
Parma/PSE
Protoform
Pro Parts RC
Putnam Propulsion
Race Rock Restaurant, Orlando, FL
RC4Less
RPM Speedway
Schumacher
Silva Concepts
SMC
Speed Mind
Superior Hobbies
SureShot Performance Products
Team 1 R/C Racing Products
TQ Hobbies
Wing House
Zubak Speed Juice

PHOTOS BY KENNY BERGSCHULTZ

FAST FACTS

- 421 on-road entries in six classes
- 359 oval entries in eight classes
- Track dimensions: 45x96 feet
- On-road run line: 326 feet
- Oval run line: 169 feet
- Total laps logged by transponder during practice, qualifiers and Mains (thanks to Doug at RC Scoring Pro): 230,502
- Total track time from 5 p.m. Monday to 10:30 p.m. Sunday: 6 days, 5½ hours (or 8,970 minutes)
- Average night's sleep: 4 hours

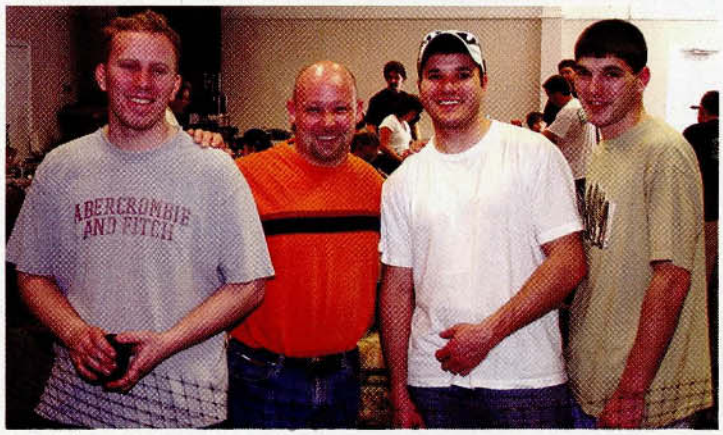
ON-ROAD A-MAINS

COMPETITION ELECTRONICS 1/12-SCALE GTP STOCK. This class took off with a clean start until pole-sitter Mark Smyka put his Trinity Reflex 12 into the pipes, and that allowed Paul Ciccarello to pilot the ship with copilots Michael Bruce and Bobby Flack. While positions shuffled in the middle of the field, Smyka worked his way back to the front. He crossed the line as the defending champion, after Ciccarello bobbled late in the race. Ciccarello held second, and Scotty Ernst wheeled his IRS Rugrat all the way from the ninth qualifying position to solidify third place.

MDI RACING TOURING STOCK. Raymond Darroch, Rob Love and Brad Johnson led early, but the order was shuffled by lap 4. Darroch opened up the distance between his Losi Triple-XS and the rest of the pack, but driver error let Paul Ciccarello and Scotty Ernst make up some valuable real estate. The battle came down to a duel between Darroch and Ciccarello. Darroch, who should have cruised to an easy win, stumbled on lap 19; he and Ciccarello were now nose to tail. The two traded paint and positions, but Darroch held on to the lead to take the checkered flag.

Left to right: Steve Pessel won the "Best Looking" category of the Parma Faskolor Concours competition with a Protoform Stratus 2.0. Bill Radigan took second, and Lynn and Tori Munno earned third.

CS HOBBY TOURING EXPERT 19-TURN. At the tone, pole-sitter Matt Francis took the holeshot with his Losi Triple-XS, followed by Brian Kinwald's Losi Triple-XS and Barry Baker's Associated TC3. The field tightened up and then shuffled on lap 4 when Baker passed Kinwald. Francis maintained his lead with clean, consistent driving, but Baker's error-free driving and great corner speed cast a shadow on Francis as Baker closed in. When Baker tried to pressure the leader, he caught a pipe, and that provided Francis more comfort room. Paul Lemieux's Losi Triple-XS had started 10th, but he worked his way to third and pushed past Mike Blackstock's Associated TC3. Francis maintained his clean run and cruised to first place followed by Baker and Lemieux.



NASCAR's Todd Bodine (in Charlie Brown shirt) poses with his fellow RC racers.

There's no mistaking the Kinwald drip job.

MINDBLOWN MOTORS 1/12-SCALE GTP MODIFIED. Mike Blackstock's Associated 12L3, Brian Kinwald's Trinity Reflex 12 and John Orr's Associated 12L3 led the cavalcade of horsepower through the first lap. Barry Baker drove his Associated 12L3 hard and took the lead but tangled with a pipe on lap 9 to allow Simo Ahoniemi's Corally 12M to move in front followed by the Sakke Ahoniemi's Corally 12M and Mike McMahon's CRC T-Force. On lap 31, Ahoniemi caught the corner dish at the exit of the sweeper, and McMahon grabbed first. On the next lap, McMahon didn't negotiate the end of the back straight, and Simo led again, with Blackstock in the second spot and Kinwald third. On the last lap, Blackstock capitalized on a Simo error in the sweeper and took the championship.

PROTOFORM TOURING SPORTSMAN 19-TURN. This one started rough; it seemed no one wanted to lead, much less avoid the pipe borders. Brad Johnson was the first to settle down after the first-lap crashes, and he took the lead with his Associated TC3. His closest competitor was Mat Stinson, who had worked his Schumacher to second from the ninth starting position. Except for some shuffling in the lower pack, the field remained the same during the next 3 minutes. With only a minute to go, Johnson was still at point, but Brandon Melton's Xtreme TC3 now held second place and Stinson third. They crossed the finish line in that order.

Even the Dirtinator can't resist the Snowbirds. Brian Kinwald enjoys a break between rounds.

SPEEDMIND TOURING PRO MODIFIED. From the tone, the field was off to a clean start, and the rides of Mike Blackstock, Jilles Groskamp and Ralph Burch formed the lead crew. On lap 4, Groskamp hung his XRAY Evo-2 on the inside pipes, which ended his week. The Losi Triple-XS sedans of Matt Francis and Paul Lemieux worked up through the field to get within striking range of Blackstock's Associated

The NASCAR connection

You probably already know that NASCAR superstar Tony Stewart is the new owner of Custom Works (CW), the number-one name in RC dirt oval racing (and soon to be a force on carpet and paved ovals, thanks to Frank Polimeda's Snowbirds win with a prototype CW machine). Tony Stewart even showed off his own oval talents when he took the wheel of Custom Works team driver Tommy Smith's ride in the 4-cell Pro Modified D-main. Although Stewart hadn't driven on the track all week, he clicked off some very fast lap times of 3.9 to 4.1, but being a little heavy on the trigger caused him to dump hard at the end.

Frank Polimeda (left) brought home a big win for new Custom Works' owner, NASCAR superstar Tony Stewart (on the right, duh).

NASCAR driver Todd Bodine also made it to the event and was quite impressed. I'm sure this isn't the last time we'll see him at an RC event. Roman Pemberton was also on hand. He's the spotter for the 01 U.S. Army Chevrolet driven by Joe Nemechek, and as an RC racer, Pemberton had a great showing with his third-place finish in the Gizzmo Racing 4-cell Expert 19-turn class.

The ever popular Charley's Steakhouse dinner. These guys know a thing or two about steak (and defribrillators).

TC3 and Burch's XRAY Evo-2. On lap 14, while heading into the back straightaway, Burch completed an inside pass on Blackstock. To regain the lead, Blackstock made the same move on Burch when he entered the chicane. But great driving gave Francis, Burch and Lemieux the lead (in that order), and Blackstock was hung out to dry in the fourth. In lap 20, Lemieux blew past Francis in the chicane to take the lead, and Burch wasn't far behind. Lemieux held the top seat until lap 25, when he came out the short, front straight a little too hot and slid the car. That allowed Burch underneath, and the rest is Snowbird history. Burch and Lemieux placed first and second, and Jared Scott took third in an XRAY Evo-2.

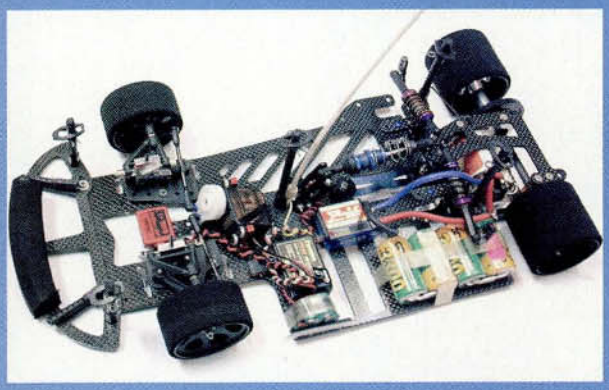
OVAL DIVISION A-MAINS

BIG DOG RC TOURING 6-CELL 19-TURN. At the tone, pole-sitter Bill Sell shot his Corally to the lead, and Tony Padilla's Schumacher snagged an early second; Eugene Ryder was third with his XRAY Evo-2. Padilla assumed the top spot at lap 3 and held it until lap 26, when a steady-charging Ryder took the position and held it for the rest of the race. On lap 29, Ken Campbell's XRAY Evo-2 moved into second, and a few laps later, David Hill's DJ Motorsports ride captured third for the final podium position.

ONTRACK RACING 4-CELL STOCK. With the drop of the green flag, Adam Brown maneuvered his KSG Motorsports XCS to the front, and he wasn't ever really challenged for the rest of the race. Brown's biggest worry was how to avoid the traction rollovers of his competitors. Jamie Tennies wheeled his

They pack 'em in tight at the Snowbirds. That's XRAY's Juraj Hudy In the foreground with his M18. Team XRAY's Ralph Burch won Touring Pro Mod.

new in the pits



Custom Works **prototype**

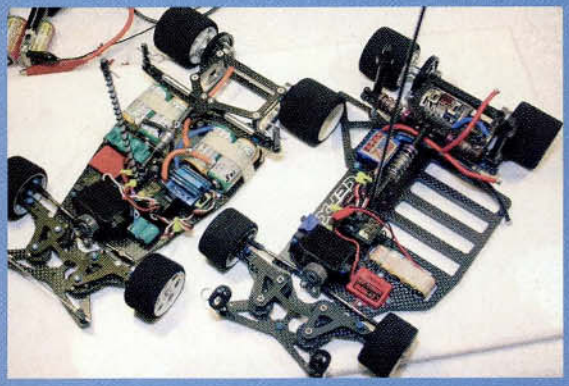
Custom Works definitely made waves at this year's Snowbirds with a win in the 6-cell Modified class. This chassis, which first hit the drawing board in December 2003, was driven to victory at the 'Bird by Frank Polimeda.

Custom Works worksrc.com.

Team 1 **power supplies**

Team 1's power supplies convert 105 to 130V to 13.6V DC and include a 2-year warranty, a cooling fan for high loads, low-line voltage protection and external fuses.

Team 1 sales@team1rc.com



CEFX **C-series chassis**

Cyrul Engineering FX (CEFX) introduced its C-12 roadcourse, C-12SS oval chassis and C-10SS oval chassis. No word yet on availability, but since Josh Cyrul designed 'em, they should go fast (pun intended).

CEFX www.cefx.net.

Trinity **Reflex 10SS**

The 10SS has run well at several events prior to the Snowbirds, and it uses many of the low-CG tricks Trinity pioneered with the latest Reflex 12.

Trinity Products teamtrinity.com

ONTRACK RACING 4-CELL STOCK

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	1	Adam Brown	KSG XCS	Handout	NS	Keyence	Futaba 3PJ	Jaco	Bolink Type D
2	2	Rick Talbot	KSG XCS	Kisbey	SMC	Futaba	Futaba 3PJ	Jaco	Protoform
3	4	Jamie Tennies	Hyperdrive 0700	Team1 R/C	Pole Position	Novak	JR R1	Jaco	Protoform Dodge

SURESHOT 4-CELL SPORTSMAN 19-TURN

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	1	Steve Goemans	KSG XCS	Team 1 R/C	Hurricane	LRP	Airtronics	Jaco	Protoform Monte Carlo
2	8	Dave Irrgang	Associated L40	Handout	Power Push	LRP	Futaba 3PK	Jaco	Protoform Dodge
3	3	Barry Hill	Hyperdrive 0700	Putnam	SMC	Keyence	Futaba 3PK	Jaco	Bolink HD Monte Carlo

GIZZMO RACING 4-CELL EXPERT 19-TURN

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	2	Rick Talbot	KSG XCS	Kisbey	SMC	Futaba	Futaba 3PJ	Jaco	Protoform
2	3	Mike Russell	Hyperdrive Pro-2	KC Racing	SRC	Novak	Futaba	BSR	Bolink
3	8	Roman Pemberton	KSG XCS	Kisbey	SMC	LRP	Futaba 3PJ	Jaco	Bolink

SILVA CONCEPTS 4-CELL PRO MODIFIED

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	5	Brian Ziegler	KSG XCS	Kisbey	SMC	LRP	Futaba 3PJ	Jaco	Bolink HD Monte Carlo
2	4	Mike Valentine	Hyperdrive	Putnam	Pole Position	Futaba	Futaba	BSR	Protoform
3	1	Greg Honeycutt	KSG XCS	Kisbey	SRC	LRP	Futaba 3PJ	Jaco	Protoform HD Monte Carlo

BADDOG RACING 1/12-SCALE 4-CELL 19-TURN

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	1	Jason Schreffler	IRS Rugrat	Sureshot	Sureshot	LRP	Futaba 3PK	TRC	McCallister Monte Carlo
2	6	Phillip VanBriggle	IRS	Team 1 R/C	Pole Position	LRP	JR R1	BSR	Bolink
3	7	Mark Recio	KSG	Team1 R/C	Pole Position	LRP	Futaba 3PJS	BSR	Protoform

RC4LESS 1/12-SCALE 4-CELL PRO MODIFIED

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	1	Phil Marabella	Trinity Reflex 12	Trinity	Trinity	Keyence	Futaba 3PK	TRC	Protoform
2	10	Eric Anderson	KSG Mini XCS	Putnam	SMC	KO Propo	Futaba 3PK	Jaco	Bolink HD Monte Carlo
3	2	Dwight Smith	KSG Mini XCS	Kisbey	Pole Position	LRP	Futaba 3PJ	BSR	Protoform Taurus

BIG DOG RC TOURING 6-CELL 19-TURN

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	5	Eugene Ryder	XRAY Evo-2	Handout	World Class	LRP	KO Propo Mars	BSR	McCallister Monte Carlo
2	2	Ken Campbell	XRAY Evo-2	Handout	Pro-Match	Novak	Airtronics	TRC	Protoform
3	10	David Hill	DJ Motorsports	Recio Mtrspts.	INS	Keyence	Airtronics	INS	INS

KSG MOTORSPORTS 6-CELL FACTORY MODIFIED

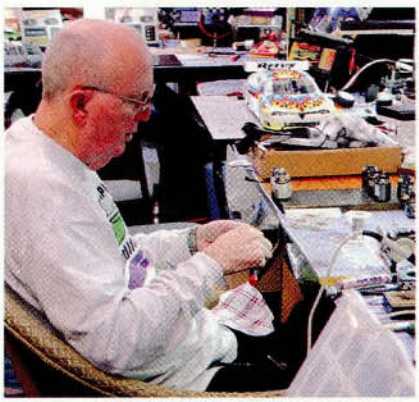
FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	1	Frank Polimeda	Custom Works	Putnam	SMC	LRP	Futaba TP3K	Jaco	Protoform
2	2	Sean Cochran	Associated L40	Reedy	Reedy	LRP	JR R1 Pro	Jaco	Protoform HD Monte Carlo
3	3	Andy McClellan	KSG XCS	Reedy	SMC	Futaba	Futaba 3PK	Jaco	INS

INS = Information not supplied by driver

click trip RCCARACTION.COM COMPLETE WINNERS' CHARTS ONLINE

Hyperdrive 0700 into third as he followed second-place Rick Talbot's KSG Motorsports XCS. Brown topped the podium, with Talbot second and Tennies third.

Just prior to the Oval Main, Precision Racing Products announced that it would provide a $100 cash contingency to any racer who won an A-main while driving with PRS pinions and spur gears. With about 30 seconds left in the race, Brown was grinning ear to ear because he was thinking, "Show me the money!"



Living legend Mike Reedy maxxed out mod motors for Snowbird supremacy. Say that five times fast.

RC4LESS 1/12-SCALE 4-CELL PRO MODIFIED. Phil Marabella's Trinity Reflex 12 ride had pretty much checked out, and he was just waiting for time to expire when Eric Anderson's KSG Motorsports Mini XCS worked its way up to mount a challenge. Anderson tried to catch and then pass Marabella coming out of turn 3, but lap traffic provided enough of a buffer for Marabella to squeak across the finish line ahead of Anderson by 0.13 second. Second qualifier Dwight Smith's KSG Motorsports Mini XCS finished third with more than 3 seconds separating him from the top two positions.

SURESHOT 4-CELL SPORTSMAN 19-TURN. Pole sitter Steve Goemans' KSG Motorsports XCS led from the tone, with Eric Thomas, also driving a KSG Motorsports XCS, in tow. On lap 24, Goemans swapped positions with Dave Irrgang who had moved up to second. Irrgang's Associated L40 stayed in front until lap 44 when Goemans retook the lead on his way to a win. Irrgang took second, and Barry Hill's Hyperdrive 0700 came in third. Despite a rough start, Hill continued to drive the Main even though his ride had a flared, right-front quarter panel; his determination paid off. Precision Racing Systems coughed up another $100 for Goemans because he was running with the PRS spur gear/pinion combo.

GIZZMO RACING 4-CELL EXPERT 19-TURN. The 4-cell Expert 19-turn class was extremely fast and provided some very close competition. The KSG

MDI RACING TOURING STOCK

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	1	Raymond Darroch	Losi Triple-XS	Handout	Trinity	Novak GT-7	JR R1	TRC	Losi Alfa
2	9	Paul Ciccarelo	Associated TC3	Handout	SMC	Novak	Futaba	Jaco	Parma Alfa
3	2	Jason Schreffler	Yokomo MR4TC	Sureshot	Sureshot	Keyence Zero V Ext.	Futaba 3PK	TRC	Protoform Mazda 6

PROTOFORM TOURING SPORTSMAN 19-TURN

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	4	Brad Johnson	Associated TC3	Handout	Hurricane	Novak	KO Propo	Jaco	Parma Alfa
2	2	Brandon Melton	Xtreme TC3	KC Racing	KC Racing	INS	INS	BSR	INS
3	9	Mat Stinson	Schumacher	Putnam	Pole Position	Keyence Zero V Ext.	Futaba 3PK	Jaco	Frewer Stratus 2

CS HOBBY TOURING EXPERT 19-TURN

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	1	Matt Francis	Losi Triple-XS	Trinity	Trinity	LRP	Airtronics	TRC	Losi
2	3	Barry Baker	Associated TC3	Reedy	Reedy	LRP	Airtronics M8	Jaco	Protoform Alfa 2
3	7	Paul Lemieux	Losi Triple-XS	Trinity	Trinity	Novak GT-7	Airtronics	TRC	Losi Alfa

SPEEDMIND TOURING PRO MODIFIED

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	2	Ralph Burch	XRAY Evo-2	Fantom	SMC	Novak GT-7	KO Propo Mars	Jaco	Protoform Alfa
2	10	Paul Lemieux	Losi Triple-XS	Trinity	Trinity	Novak GT-7	Airtronics M8	TRC	Losi Alfa
3	7	Jared Scott	XRAY Evo-2	Fantom	SMC	Novak	KO Propo	Jaco	Protoform Alfa

COMPETITION ELECTRONICS 1/12-SCALE GTP STOCK

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	1	Mark Smyka	Trinity Reflex 12	Handout	Trinity	Novak GT-7	Airtronics	TRC	Parma Speed 8
2	2	Paul Ciccarello	CEFX C-12	Handout	SMC	Novak	Futaba	Jaco	Parma
3	9	Scotty Ernst	IRS Rugrat	Team 1 R/C	Reedy	Novak GT-7	KO Propo Helios	Jaco	Protoform Speed 12

MINDBLOWN MOTORS 1/12-SCALE GTP MODIFIED

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR/TUNED	BATTERY	ESC	RADIO	TIRES	BODY
1	1	Mike Blackstock	Associated 12L3	Reedy	Reedy	Novak GT-7	KO Propo	Jaco	Protoform Speed 12
2	7	Simo Ahoniemi	Corally 12M	Corally	Corally	Nosram	Sanwa M8	Corally	Parma Speed 8
3	3	Brian Kinwald	Trinity	Trinity	Trinity	Novak	Airtronics M8	TRC	Protoform

INS = Information not supplied by driver

When the racing, practicing and wrenching go on for 24 hours, you sleep when and where you can.

Motorsports XCS rides of Jim Rufiange and Eric Anderson ran one and two after Brian Ziegler's pole car was tied up on lap 5. In lap 26, Anderson took over the point and that moved Rufiange to second. Rick Talbot's KSG Motorsports XCS held third with Anderson in his sights. In lap 33, Rufiange led again, but Anderson and Rufiange were knocked out of the running in lap 39, and Talbot took the lead. By lap 43, Mike Russell's Hyperdrive Pro-2 was second and Roman Pemberton's KSG Motorsports XCS was third; they ran in that order to the tone.

KSG MOTORSPORTS 6-CELL FACTORY MODIFIED. On the opening lap, a pileup allowed Frank Polimeda's new Custom Works/Putnam Propulsion powered ride to increase the real estate between him and his closest competitor. Polimeda started to envision his trip to victory lane. Associated's Sean Cochran steadily worked through the pack. By lap 32, Polimeda was well on his way. Arnie Fie and his Custom Works car popped briefly into third, only to relinquish it to KSG's Andy McClellan at lap 47. Polimeda crossed the line first to provide the first major win for the Custom Works prototype oval car. Cochran and McClellan rounded out the top three.

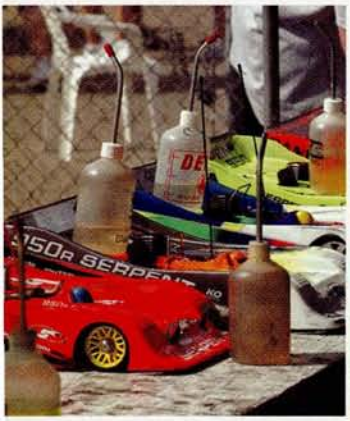
BADDOG RACING 1/12-SCALE 4-CELL 19-TURN. From the tone, it was an easy run for pole-sitter Jason Schreffler and his IRS Rugrat. He had a scary moment when Sonny Brown's radio problems caused his car to go in circles in turn 3. This shuffled the entire field, and affected many of the final positions. Schreffler crossed the line at the tone with a 2-lap win ahead of Phillip VanBriggle's second-place IRS ride and Mark Recio's KSG in third.

SILVA CONCEPTS 4-CELL PRO MODIFIED. The final race of the Snowbird Nationals was the Silva Concepts 4-cell Pro Modified A-main. Pole-sitter Brian Ziegler led from the tone with Greg Honeycutt in tow; both drove the KSG Motorsports XCS. Honeycutt worked on Ziegler but was slowed by lap traffic. In lap 54, Honeycutt took the lead, but they both got tied up in turns 3 and 4, and Honeycutt received the proverbial short end of the stick. Ziegler stayed on track to win, and Mike Valentine's Hyperdrive sneaked past Honeycutt for second, so Honeycutt took third.

THE WRAP-UP

Given the tight schedule and long hours, the event was nothing short of spectacular! Many drivers are already planning their return trips, and Mike Boylan is sketching out the schedules and activities for next year. Sleep now because the 11th Annual Snowbirds Nationals will be here before you know it! See you then! ■

by Mike Myers



2004 FLORIDA WINTERNATS

MUGEN & SWAUGER REIGN SUPREME!

The 2004 Florida Winternats (also known as the Southern Gas Champs) was held in Fort Myers from Sunday, February 8, through Saturday, February 14. The 28th running of this prestigious event took place at the Lee Civic Center, its longtime home.

THE TRACK

This very fast track is 90 feet wide by 150 feet long and has a 635-foot racing line. Here, top-level drivers are at full throttle for about 75 percent of each lap, and they hold it at ten tenths through the infamous and treacherous front chicane, through the sweeper and all the way down the back straight. Racers ease up on the throttle only in the few slow corners; otherwise, it's usually full punch.

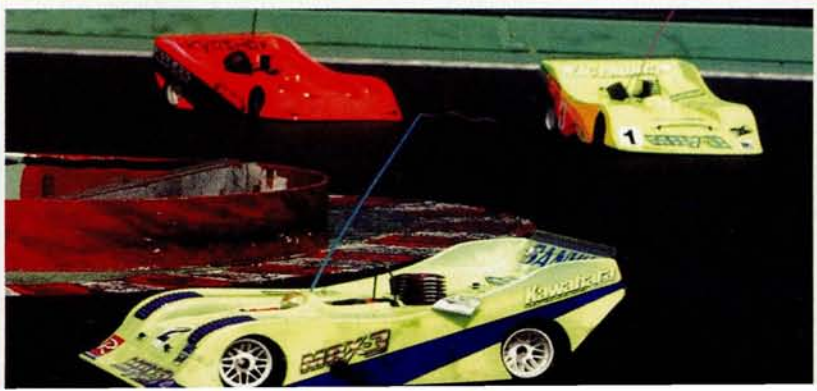
The metal boards have been known to re-kit any car that makes hard contact with them. They also amplify the noise of a crash, making the sound even worse than the "bite" [actual damage sustained]. The well-prepped racing surface provides good traction, but it's abrasive and wears many tires to the rims in the time it takes to complete a long Main.

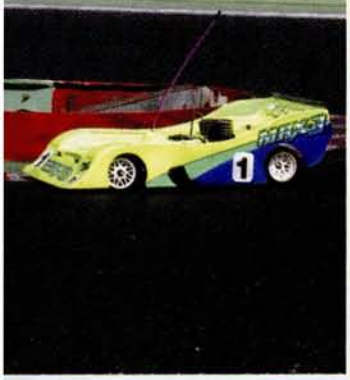
200MM TOURING

Michael Salven took TQ honors, followed by Ralph Burch Jr. also driving a 710. Fukuda and Swauger, driving a pair of Mugen MTX-3 cars, were the next two on the grid. Swauger was very fast in qualifying, but his powerful engine required a refueling stop to finish the 5-minute qualifiers. All that gas-guzzling horsepower was a disadvantage in the short qualifying rounds but served him well in the 40-minute A-main. Despite a few hurdles, Swauger recovered and took home top honors in this hotly contested class. His JP-powered MTX-3 and spot-on driving skills simply outclassed the field, and he crossed the finish line well ahead of the six other cars.

1/10 OPEN A-MAIN

The latest ROAR rules allow racers to run either the standard 235mm 1/10-scale 4WD cars or one of the newer 200mm "open" class cars that are run with wide-open engine rules. The 200mm cars run .12 engines that have a weight advantage; the 235mm cars run .15 engines and are allowed 80cc fuel tanks—5cc more than the 200mm cars.





Prohias, Vega and Bedasse, running Serpent machines, were the top three qualifiers, while McFarlane and Tate slotted their Mugen cars into the next two spots. The final was well populated with 200mm cars, yet the 235mm cars moved to the front of the field. Prohias was shuffled to the rear of the pack after a rough first lap, but he worked his way back to a second-place finish with his Serpent 835. Vince Tate, however, was the man on the move, and he took the win with his 235mm Mugen Avance.

1/8 4WD A-MAIN

Burch and Salven traded places on the grid to start the Main, with Burch as TQ this time. Salven slotted into second, Cyrul put the new Kyosho F2004/Evolva into third, and Fukuda, Swauger, Tanaka and Horta filled the next four spots respectively with their Mugen MRX-3 cars.

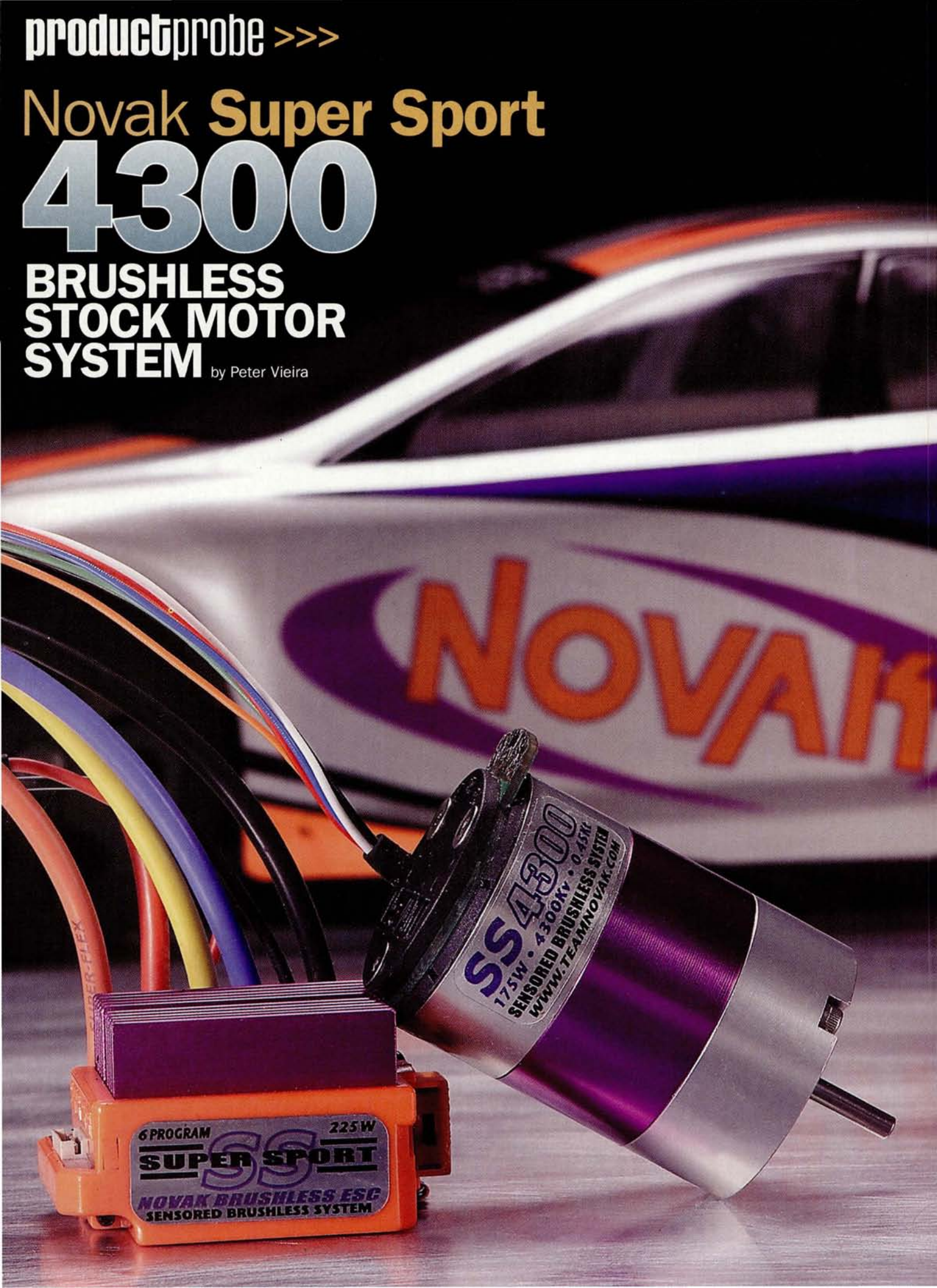
Lots of attrition in this class made the Main a contest of smart driving, strategy and a little bit of luck. Early contact between Cyrul and Salven sidelined Salven in the first minute and then Cyrul only minutes later. The second Kyosho car in the Main, driven by David Spashett, retired shortly thereafter. Fukuda, Horta, Burch Jr. and Tanaka all retired early, which left just three cars on the track to cross the finish line. Swauger was the fastest of the remaining trio, skillfully dodging bullets to take his Mugen MRX-3 home—for a Mugen clean sweep of all three classes and a second victory for Swauger.

DRIVER	CAR	ENGINE	FUEL	PIPE	TIRES	BODY	RADIO
200MM TOURING							
Mike Swauger	Mugen	JP X12	Mugen 40	Mugen	Kawahara	Losi	Airtronics
Keisuke Fukuda	Mugen	Novarossi	Mugen 30	Mugen	Kawahara	Protoform	Airtronics
Ralph Burch Jr.	Serpent	NovaMega	Fantom 30	NovaMega	Ellegi	Serpent	KO Propo
Yuruki Kazuya	Mugen	JP X12	Mugen 30	Mugen	Kawahara	Protoform	Airtronics
Paul Wynn	Schumacher	Novarossi	Maxy 30	Rossi	Take Off	Protoform	Airtronics
Jared Scott	Serpent	NovaMega	Fantom 30	NovaMega	Ellegi	Serpent	KO Propo
1/10 OPEN							
Vince Tate	Mugen	JP	Mugen 30	Rex	Fast	Mugen	KO Propo
Juan Prohias	Serpent	NovaMega	Fantom 30	NovaMega	Ellegi	Serpent	Airtronics
Julian Hope	Serpent	NovaMega	Byron 30	NovaMega	Ellegi	Serpent	KO Propo
Rick Bedasse	Serpent	RB	J-Tech 30	RB	Ellegi	Serpent	KO Propo
Joe Sumasky	Serpent	NovaMega	Fantom 30	NovaMega	Ellegi	Serpent	JR Racing
Omar McFarlane	Mugen	RB	J-Tech 30	RB	Take Off	Racers Edge	JR Racing
1/8 4WD							
Mike Swauger	Mugen	JP	Mugen 40	Rex	Kawahara	Mugen	Airtronics
Rick Vrielunck	Mugen	JP	Mugen 30	Novarossi	Enneti	Mugen	KO Propo
Ted Hammer	HPI	Top	O'Donnell 25	Top	Delta	Delta	KO Propo
Masao Tanaka	Mugen	JP	Mugen 30	Rex	Kawahara	Mugen	Airtonics
Ralph Burch Jr.	Serpent	NovaMega	Fantom 30	NovaMega	Ellegi	Serpent	KO Propo
Danny Horta	Mugen	Novarossi	Maxy 30	Rex	Fast	Mugen	KO Propo

Thanks to all the racers who participated in the Winternats, to the members of the Ft. Myers RC Car Club who hosted it and to the people from Serpent USA, Fast N Furious R/C and Brooklyn Hobbies for their support. As always, race director Jim Rice and crew had everything well organized and running like clockwork. ■

Novak Super Sport 4300 BRUSHLESS STOCK MOTOR SYSTEM

by Peter Vieira



Will Novak rock stock?

Novak's original SS5800 brushless motor performs like a conventional 10-turn modified motor, which is great for power-hungry drivers but not so great for drivers who can't handle the horsepower, don't require the horsepower, or simply want to stretch their run times. For those guys, Novak has introduced the SS4300—the first brushless "stock" motor. It's offered in a combo with the Super Sport speed control for direct installation into any car or truck that accepts brushed 05 motors (aka "regular" motors). Is this a new way to race? The ultimate way to play? We tested the Super Sport stock system against good ol' brush power to get the answers.

INSIDE THE SUPER SPORT SPEED CONTROL

Novak's SS4300 motor is new, but the Super Sport speedo is not; it's the model included with the SS5800 "mild-modified" motor set. In case you missed our review of the system in the July 2003 issue, here's a recap of the Super Sport ESC's features:

ONE-TOUCH SETUP. Just like Novak's "regular" ESCs, all you need to do to set up the Super Sport ESC is push a single button.

RADIO PRIORITY CIRCUITRY. As the battery dumps, the Radio Priority system makes certain that the receiver and steering servo have all the power they need, even when the motor is trying to draw off every last amp.

LOCKED ROTOR DETECTION. Because the Super Sport system is sensor-based, the ESC can "tell" when the motor is stalled and cuts power to prevent damage.

THERMAL-OVERLOAD PROTECTION. Both the SS4300 motor and Super Sport controller are equipped with temperature sensors. If either component becomes dangerously hot, the system will shut down until it has cooled enough to operate safely.

DIRECT-SOLDER WIRING TABS. External solder tabs on both the motor and ESC make it easy to replace the power wires. Go ahead and cut them as short as you like for a custom install; you can easily replace the wires later.

SIX USER-SELECTABLE THROTTLE PROGRAMS. The chart below shows the details of each program. Depending on which program you select, the ESC will vary rpm (unlimited or maximum 24,000rpm), acceleration rate (unlimited or fixed), minimum brake (low or high) and reverse (on/off). "Unlimited" rpm means that the motor will not be prevented from reaching its maximum rpm of 30,960 at 7.2 volts. "Unlimited" rpm doesn't mean "infinite" rpm! Likewise, "Unlimited" acceleration simply means that the ESC will accelerate the motor as quickly as available battery power allows. When using the "Limited" setting in the Sportsman program, the ESC fixes the acceleration rate. This is a great equalizer when you race a guy with a Super Sport system.

THROTTLE PROGRAMS

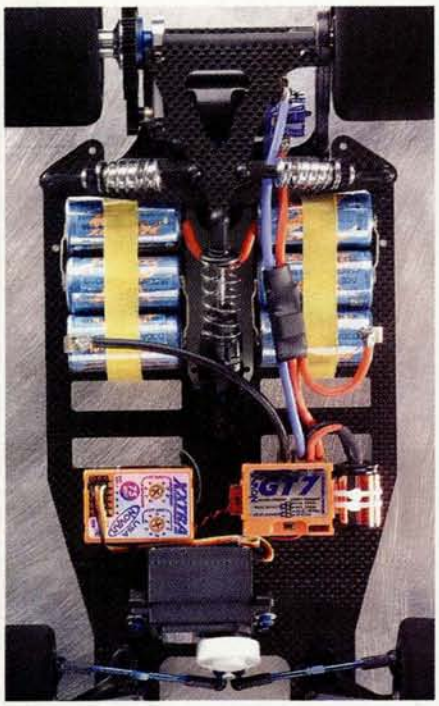
	SS Standard		SS High		Sportsman	
PROGRAM	1	2	3	4	5	6
RPM	Unlimited	Unlimited	Unlimited	Unlimited	24,000	24,000
ACCELERATION	Unlimited	Unlimited	Unlimited	Unlimited	Fixed	Fixed
MIN. BRAKE	Low	Low	High	High	Low	Low
REVERSE	Yes	No	Yes	No	Yes	No

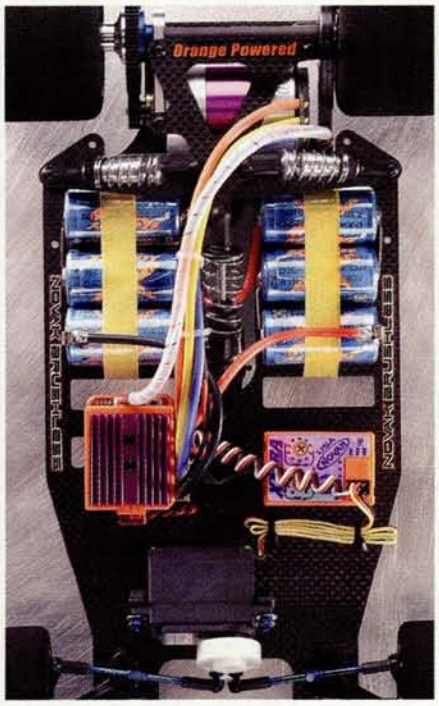
KV AND KT
WHAT THEY ARE AND WHY THEY MATTER

The Kv and Kt values are important brushless-motor specs, but what the heck do they mean? In a nutshell, Kv is the motor's rpm rating, and Kt is its torque rating. The bigger the Kv and Kt numbers, the more speed and power you'll have. Here's the scoop, straight from Novak:

KV This number is the motor voltage constant expressed in rpm/volt. This indicates how fast the motor will turn for a given voltage (given there is no internal resistance). As an example, the SS4300's Kv rating is 4,300 rpm/volt. Therefore, if a 6V battery pack is used, the SS4300's rpm would be 25,800 (6x4,300). Comparatively, a typical 10-turn brushed motor's Kv rating is 5,400rpm/volt.

KT This number is the motor torque constant expressed in ounce-inch of torque per amp of current. This number is the amount of torque a motor produces per amp of current draw. As an example, the SS4300's Kt rating is 0.45 oz.-in./amp. Therefore, if the motor draws 5 amps, the SS4300 would produce 2.25 oz.-in. of torque (5x0.45). Comparatively, a typical 10-turn brushed motor's Kt rating is 0.33 oz.-in./amp.





On the right, a standard brushed setup; on the left, the SS4300 combo. The Super Sport ESC is larger and has more wires, but it isn't that much bigger—fitting into your ride shouldn't be an issue.

MANUFACTURER'S SPECS

ESC

Input voltage	4 to 7 cells (4.8 to 8.4 volts)
Weight (w/o wires)	1.7 oz. (48.2g)
Power rating	225 watts @ 25 deg. C junction temperature
BEC voltage	6 volts/3 amps

MOTOR

Diameter	1.41 in. (35.8mm)
Length	2.08 in. (52.8mm)
Weight	6.4 oz. (181.4g)
Power rating	175 watts
Kv	4300rpm/volt DC
Kt	0.45 oz.-in./amp
Commutation	Sensor-based electronic
Magnet material	Neodymium (1 pc./multipole)

testing

The SS4300 is designed to emulate brushed stock-motor performance, so it made perfect sense to test the system against a brushed motor and ESC combo using two otherwise identical vehicles. We built a pair of Associated RC10L3 touring chassis to serve as our test cars and equipped one with a Reedy MVP stock motor and Novak GT7 ESC, while the other car got the SS4300 setup. Both cars ran on Reedy/Yokomo X-Cell GP3300 matched packs with identical numbers, wore ProtoForm Mazda 6 shells (paint by Bill Zegers) and were controlled by Hitec CRX radio systems. The SS4300 car was geared one tooth lower than the brushed car, as per Novak's suggestion. All the testing went down at Hobby Chamber in West Haven, CT.

TEST 1: RUN TIME. Assistant editor Matt Higgins and I simply followed each other around Hobby Chamber's road-course until one of the cars dumped. When running at race pace, the MVP-equipped car always pooped out first with an average run time of 6 minutes. The SS4300 car kept on chugging for over 10 minutes, with a best run of over 12 minutes. This was with the "SS Standard" program that does not limit acceleration or rpm.

TEST 2: SPEED AND POWER. Using the SS Standard setting, the SS4300 car was clearly faster and accelerated harder than the "brushed" car. We also tested the Sportsman setting, which reduced acceleration and top speed but generated performance on par with the brushed-motor setup. Overall, the Novak brushless system outperformed the brushed setup on the track, and we found that it had more power than we needed on every section but the straight. On Hobby Chamber's long back section, the SS4300 had better acceleration and easily pulled away by 20 feet before it reentered the infield section. Running in the infield, the two cars were equal only because the brushless system couldn't put all its power down on the track. With better traction, the SS4300 clearly would have produced better lap times than the brushed setup. On the slightly slick track, the SS4300's average lap times were only 0.4 second faster.

TEST 3: BRAKING. Braking performance is harder to quantify, so this test was more about "feel" (and keep in mind that brushed-motor brake feel varies depending on the motor's wind, ESC brand, ESC setup and radio setup). We chose the GT7's "stock" program. Stock motors always deliver powerful braking, and the Reedy MVP is no exception. The GT7 speed control gives very good brake feel, but as we got closer to maximum brake, it became tough to sense just when we would exceed the tires' limits. The SS4300's brakes could clamp down just as hard but didn't feel as aggressive. It was just a supersmooth progression from the lightest touch of brake up to full-lock. Just be prepared to adjust yuor braking style. The SS4300 motor does not have the off-power "drag brake" effect of a brushed motor and will coast forever. If you let off expecting to automatically scrub speed, you'll probably drill the boards.

TEST 4: THROTTLE FEEL. No numbers here; "feel" is strictly subjective. Matt and I agreed that the SS4300 felt supremely smooth compared with the brushed motor. The superfine control made it easy to drive at partial throttle through tight sections, whereas full-throttle blasts in the unlimited programs gave our Associated test car tire-searing acceleration. If your track or driving style requires fine throttle control, you'll really appreciate the feel of the SS4300. For slam-on-the-gas, slam-on-the-brakes driving, the SS4300 doesn't really feel any different from a brushed motor.

NOW HOW MUCH WOULD YOU PAY?

At about $240, the Super Sport system isn't cheap. If you stick with brushed stock motors, that same $240 could buy you a Novak GT7 ESC and two stock motors—three, if you get a good deal. But there are other factors to consider. One is wear and maintenance. The brushed motors will require the usual care and feeding (namely brush replacement and comm-lathe attention), while the SS4300 is basically maintenance free. Versatility is another consideration. The GT7 is an excellent racing speed control, but all it does is race. With no reverse capability, the GT7 isn't the hot setup for playing around. The Super Sport controller's reverse capability makes it perfect for play (or practice on the track—you won't need anyone's help to get the car off the boards). Racing, however, is a problem for the Super Sport, since it outperforms standard stock motors and thus defeats the purpose of stock-class racing. For racing, brushed motors still rule. But if you get a brushless setup, you can practice at the track and/or play with your car all week while you save your hot brushed stocker for race day. And if you aren't a racer at all, there's no good reason not to go brushless, except for the cost. How much are no-maintenance convenience, greater power and longer run times compared to brushed stock motors worth to you?

SOURCES

HITEC RCD INC. (858) 748-6948; hitecrcd.com.

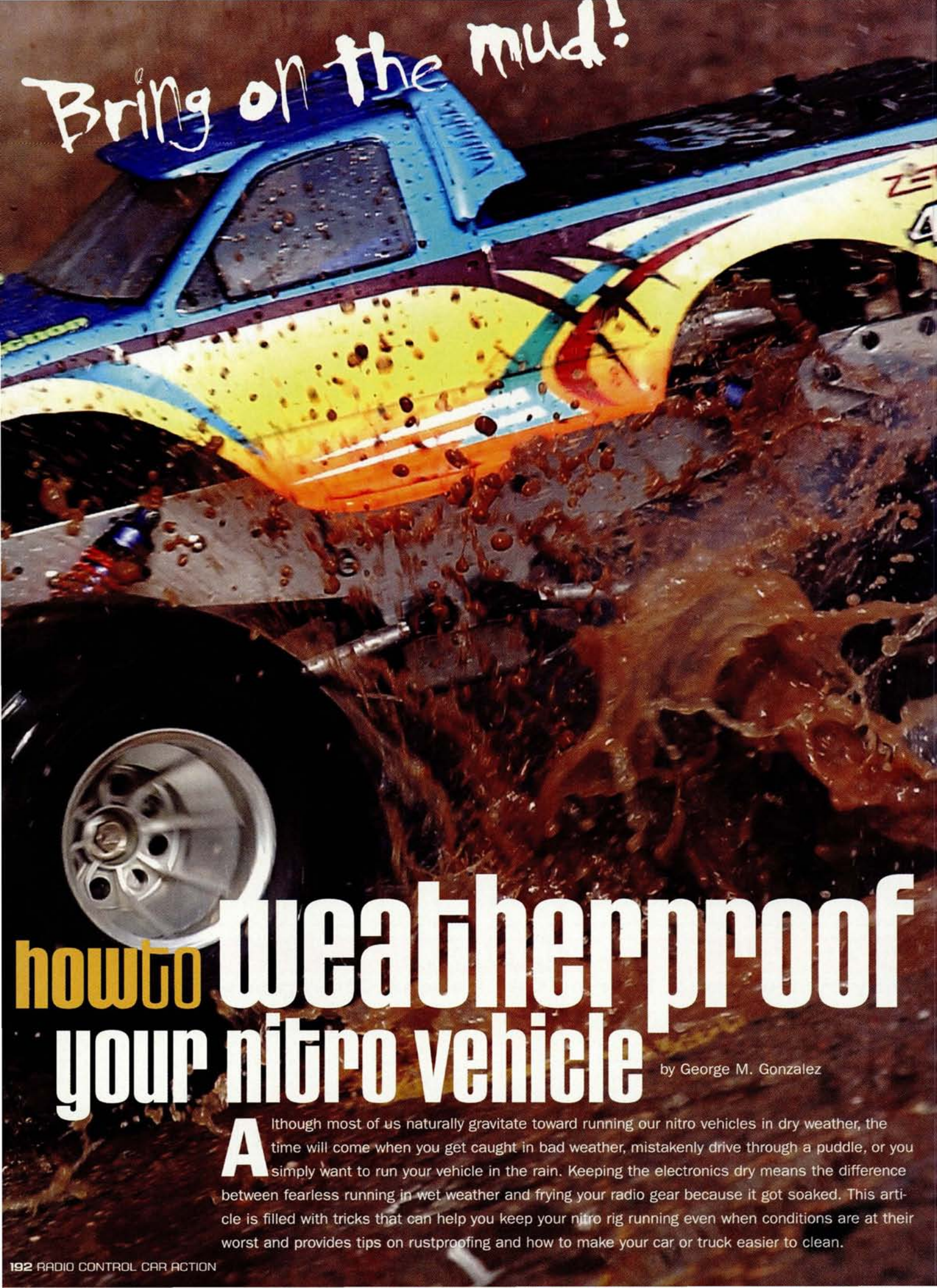
NOVAK ELECTRONICS INC. (949) 833-8873; teamnovak.com.

PROTOFORM INC. distributed by Pro-Line (909) 849-9781; pro-lineracing.com.

REEDY a division of Team Associated.

TEAM ASSOCIATED (714) 850-9342; teamassociated.com; rc10.com.

ZEGERS R/C GRAFFIXXS (561) 988-5411; rcpaintman@aol.com.



how to weatherproof your nitro vehicle

by George M. Gonzalez

Although most of us naturally gravitate toward running our nitro vehicles in dry weather, the time will come when you get caught in bad weather, mistakenly drive through a puddle, or you simply want to run your vehicle in the rain. Keeping the electronics dry means the difference between fearless running in wet weather and frying your radio gear because it got soaked. This article is filled with tricks that can help you keep your nitro rig running even when conditions are at their worst and provides tips on rustproofing and how to make your car or truck easier to clean.

WEATHERPROOF YOUR SERVOS

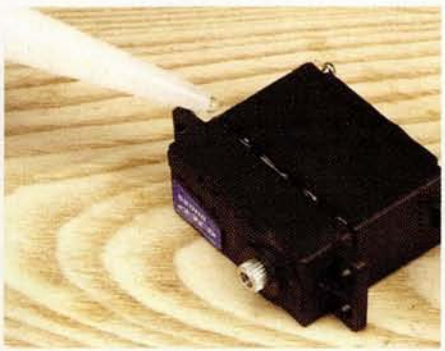
Most high-end servos feature O-ring-sealed cases and factory-installed silicone weatherproofing. If you already have weatherproof servos, move on to the next section, but if your servos aren't protected, then continue reading. You'll need silicone sealant (the type sold at hardware stores or pet stores for fish tanks) to complete the following steps.

Here is the silicone-sealed servo. The case seams, screw holes and harness lead are all protected from moisture. The wet stuff can *still* enter through the output gear opening in the servo case, so don't drive your vehicle through puddles.

YOU'LL NEED

- Silicone sealant
- Party balloons
- Zip-ties
- Wet-type air filter
- WD-40

1 SEAL THE SERVO-CASE SEAMS. First, loosen the four screws at the back of the servo and open the servo case slightly. Apply silicone sealant to the edges where the sections are joined, and work it all the way around the case. Do not tighten the servo-case screws until you have completed the next step.



2 SEAL THE MOUNTING SCREWS. Before you tighten the servo-case mounting screws, apply a dab of sealant under the screw heads; this will seal the screw holes when the screws are tightened. Gently tighten the screws and then rub the excess sealant around the screw heads. Also, push the extra silicone along the seam where the servo case is joined to ensure a proper seal there, too.

3 SEAL THE WIRE HARNESS. Apply a dab of sealant where the wire harness exits the servo case. Work the silicone around the harness so that it completely seals the exit hole. Some servos have a small rubber bushing pressed inside the servo case where the harness exits. In this case, apply silicone around the base and to the top of the bushing where the harness exits. Let it dry overnight before you reinstall the servos.

This receiver is well protected against moisture. You'll have to cut off the zip-tie to access the frequency crystal, but it's a minor inconvenience for the protection that can save you big bucks in the long run.

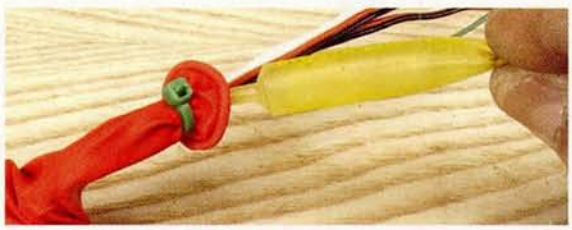
SEAL THE RECEIVER, ON/OFF SWITCH AND ONBOARD BATTERY PACK

Most onboard electronics in nitro vehicles are housed in a receiver box. Although they offer protection, most receiver boxes are not moisture-proof, so taking precautions to weatherproof your receiver will prevent that dreaded DNF. I'll show you a simple way to cover the receiver with a balloon that will keep it dry in even the wettest conditions.

Your receiver's battery pack will still operate if it gets wet, so it isn't essential to protect it from the elements, but moisture can corrode the batteries. It's a good idea to use a second balloon to protect the receiver batteries.

If your vehicle has a receiver switch, install a rubber boot over the sliding part of the switch. The boot is available at most hobby shops, and it shields the switch from mud, water and cleaning solvents.

1 "BALLOON" THE RECEIVER. Install the receiver inside a balloon; a medium-size party balloon will do the trick. You have to really stretch the opening to fit the components inside. Position the receiver so its wires exit through the neck of the balloon.



2 SEAL THE BALLOON. Install a zip-tie around the balloon's opening. Apply a dab of grease around the wires where they exit the balloon to prevent moisture from getting inside. Install the receiver back into its box, and you've finished.

MOISTURE-PROOF YOUR AIR FILTER

You've weatherproofed your onboard electronics, but what about the air filter? It can get wet when the car is driven through a puddle and can get caked with mud during a long Main. A soaked or clogged air filter can cause the engine to flame out, so if you run in damp or muddy conditions, consider installing a wet-type air filter.

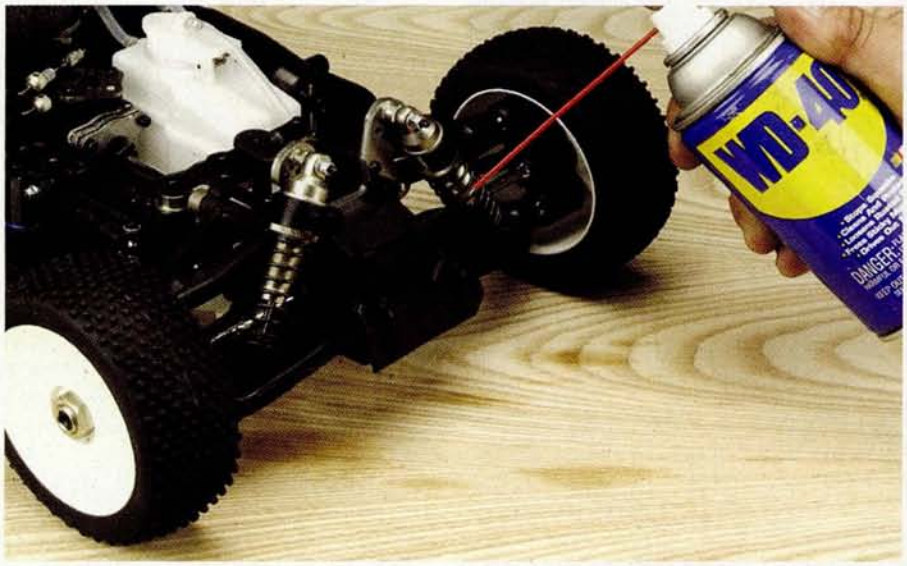
A wet-type air filter, like this one from Kyosho, will keep the air filter dry while racing in damp conditions. When the weather is dry and the track isn't muddy, just remove the molded air-filter housing. Be sure to use a zip-tie to secure the air filter to the carburetor.

MOISTURE-PROOF THE SUSPENSION AND DRIVELINE

Your vehicle is not truly weatherproof until you've sprayed WD-40 over the suspension and chassis. Apply it liberally to the suspension arms, hinge pins, bearings and axles (CV, universal and dogbones). While you're at it, spray WD-40 on both sides of the chassis and around the engine case. Wipe off the excess with a rag.

Your vehicle is now ready to race in the dampest conditions. The WD-40 will prevent moisture from corroding your vehicle's metal parts while providing important lubrication. It also makes the vehicle much easier to clean after the race.

Spraying WD-40 on the suspension and chassis protects them from moisture, lubricates your vehicle's suspension and driveline components and makes your car or truck easier to clean after a race.



Stainless-steel screws will never rust and are stronger than typical steel screws, which is why they're popular with nitro racers who are in the know.

RUSTPROOF FASTENERS

Many RC vehicles are put together with a variety of steel screws and fasteners. Unfortunately, steel screws can rust when they're exposed to moisture on damp and muddy tracks. Rusty screws are nearly impossible to remove and can make periodic maintenance a hassle.

The best way to prevent rust is to outfit your car and truck with a complete set of stainless-steel screws and fasteners. They are not only rustproof; they're also stronger than typical steel screws, which means that they aren't as easily bent.

RC Screwz offers complete sets of stainless-steel screws for just about any RC vehicle. Sets include high-quality stainless-steel cap- and round-head hex screws, locknuts, flanged nuts and washers. The screw sets are sold in reusable plastic boxes and come with a set of hex wrenches of corresponding size.

SOURCES

KYOSHO; distributed by Great Planes
(217) 398-6300; (800) 682-8948; kyosho.com.

RC SCREWZ (734) 765-8870; rcscrewz.com.

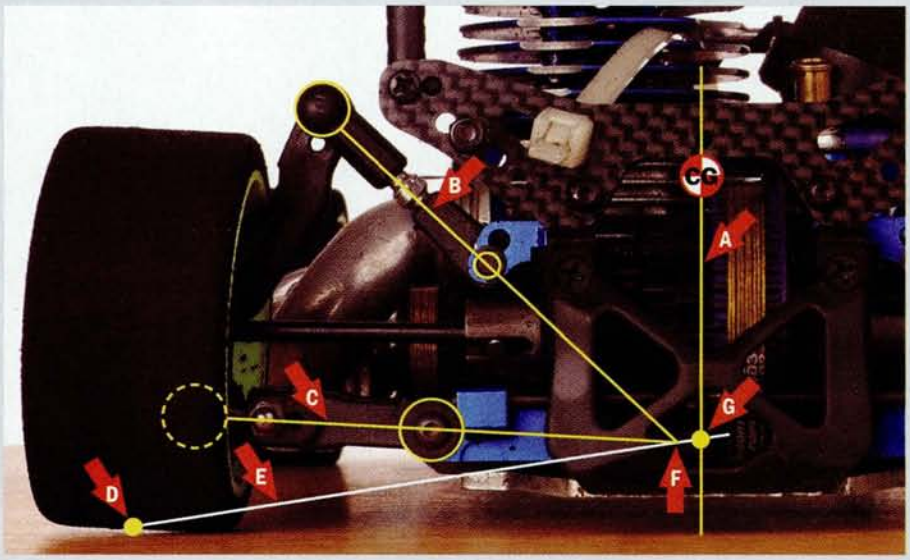
how to adjust

Most elements of chassis tuning are easy to visualize and understand. It's not hard to wrap your head around concepts like ride height, toe-in, camber and shock angle. But there is one important part of the performance picture that many drivers completely misunderstand (if they acknowledge it at all): roll center. I'll explain what it is, how to adjust it, and why it matters. Roll center isn't hard to understand, and knowing how it affects handling can give you an advantage on race day.

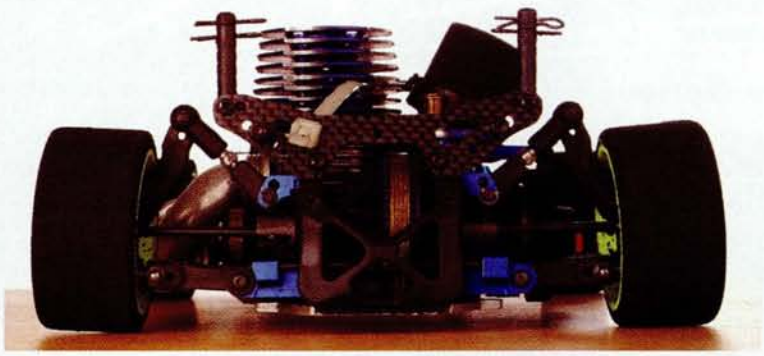
WHAT IS ROLL CENTER?

Roll center is the theoretical longitudinal axis that the car rolls around from right to left, or vice versa, in response to cornering loads. The height and lateral position of this axis is determined by the angles and lengths of the upper camber links and lower suspension arms. Roll center affects weight transfer, and weight transfer helps determine how much the tires will grip: the more weight is transferred to a tire, the more traction it will have. The photo on the right shows how roll center is determined. The camber-link and suspension-arm vectors are extended until they meet. Then a line is drawn from the center of the tire's contact patch to the point where the camber link and suspension-arm vectors meet. The point at which the tire line intersects the chassis centerline is the car's roll center.

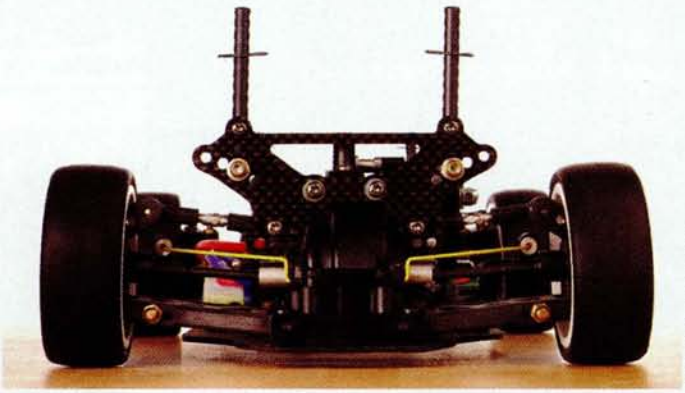
This photo also diagrams the car's center of gravity (or at least a guess as to its location; there's no practical way to measure it). Center of gravity (CG) and roll center work together to affect handling. The more distance there is between the two, the more weight will be transferred to the outside tires when cornering. It's easy to visualize how this works. Imagine mounting a billiard ball on your chassis with a foot-long dowel, giving the car an extremely high CG. As the car turns, that extremely tall CG will transfer a ton of weight to the outside tires—so much that the car will certainly flip over.



To determine the roll center of your vehicle, find the point at which the camber-link (B) and suspension arm (C) vectors meet (F). Then draw a line (E) from the center of the tire's patch point (D) through the intersection of the two vectors to the centerline (A). This point (G) is the roll center.



A nitro car requires a much higher roll center because the tall engine raises the car's CG. Compare the camber-link angle of the nitro car (left) with an electric car's (right).



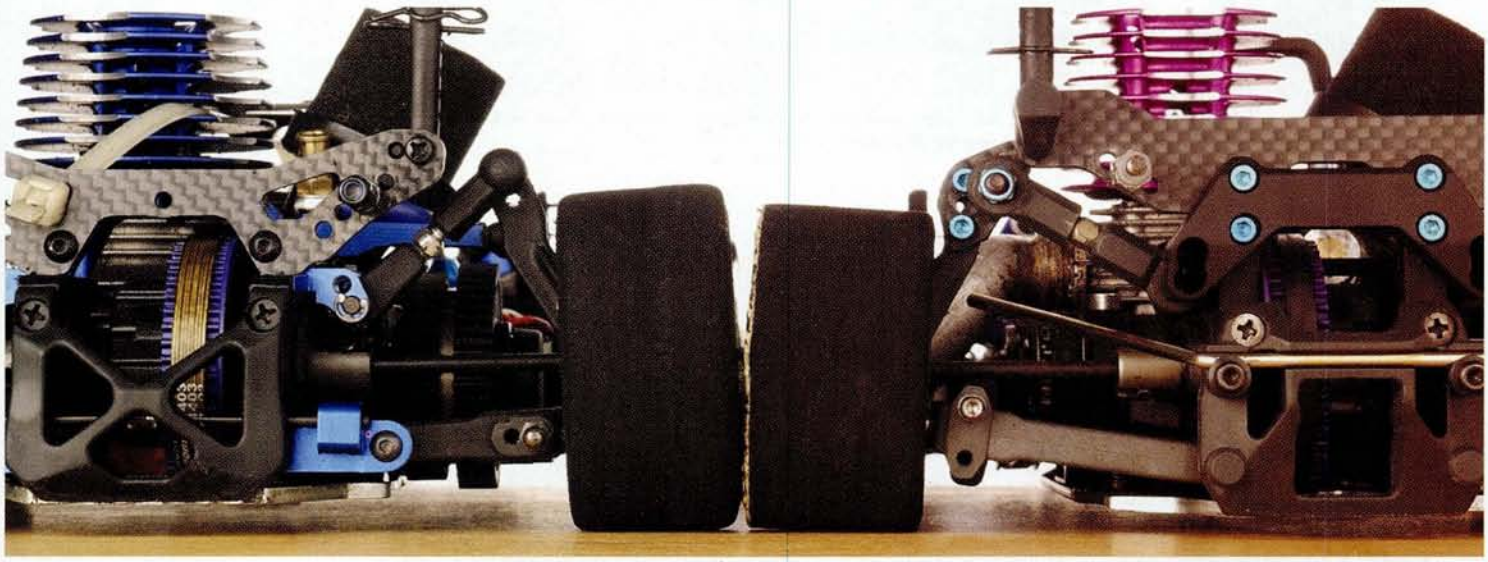
Electric cars have a much lower CG because their heaviest components (the motor and batteries) are carried very low on the chassis, so they don't require a high roll center to prevent surplus weight transfer.

PHOTOS BY JOHN HOWELL

roll center

Roll on through the turns

by Joel Johnson



The Trinity G4 (left) has level arms when set at race ride height; this lowers its roll center and makes it a better choice for high-bite tracks. The Reflex NT (right) has a lower roll center at the same ride height because of its angled lower arms. The NT works better on low-bite tracks because its lower roll center causes cornering loads to transfer more weight to the outside tires.

HIGH VERSUS LOW ROLL CENTER

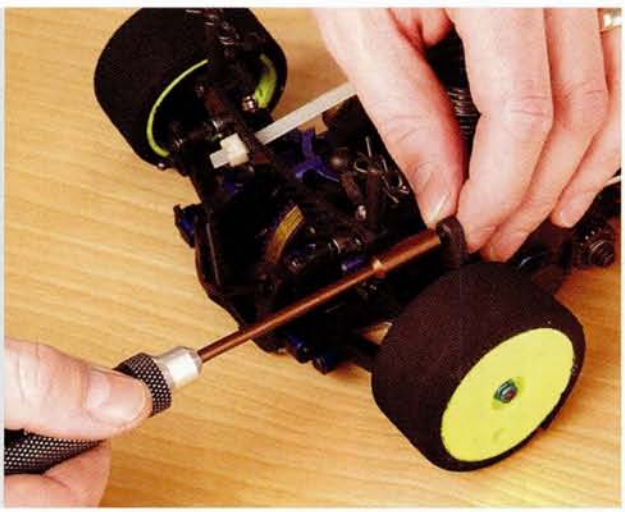
LOWERING ROLL CENTER. Lowering roll center (or, more accurately, increasing the distance between the car's roll center and its CG) will cause the chassis to roll more in turns, transfer more weight to the outside tires and give them more grip. Low-traction situations usually require a lower roll center for this very reason. If you're looking for more steering, lower the front roll center; for more rear traction, lower the rear roll center.

RAISING ROLL CENTER. High-traction situations such as running on carpet usually require a higher roll center (less distance between the roll center and CG). This prevents the car from transferring too much weight and feeling lazy when transitioning between left and right turns (or vice versa), or worse, traction rolling. Raising the front roll center will typically take away steering, and in the rear, it will take away grip.

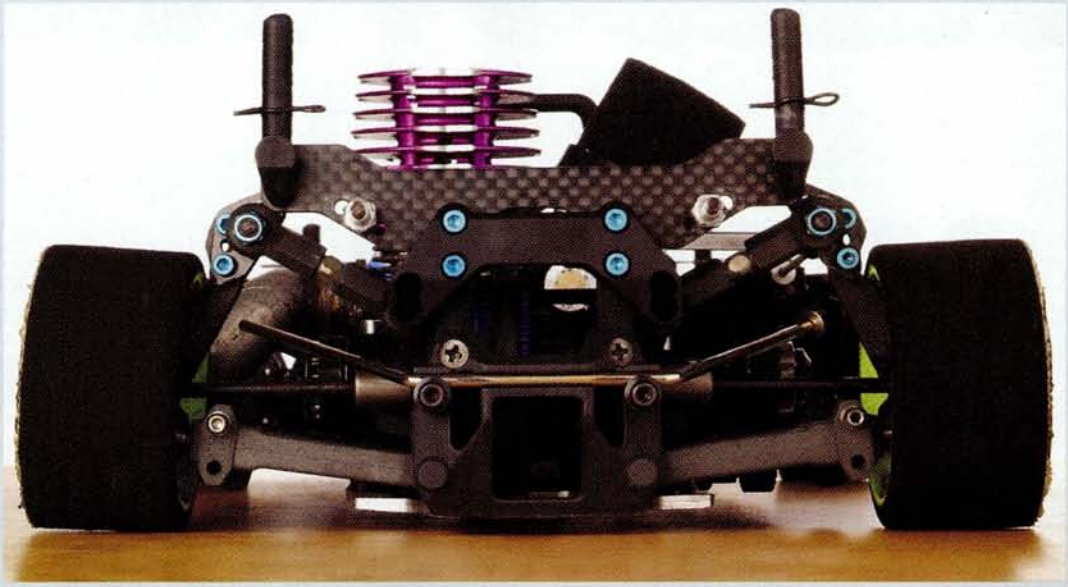
HOW TO DO IT

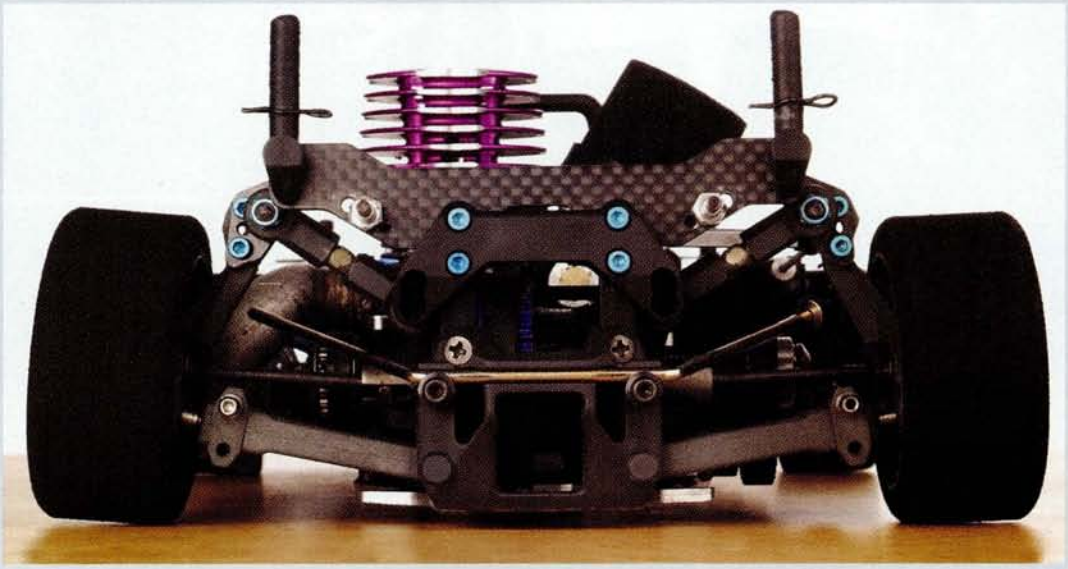
LOWER ROLL CENTER. To lower the roll center, you either raise the upper camber link's inboard pivot, or lower the link's outer pivot. Either will work; the method you choose will likely depend on the configuration of your car. The way most cars are designed these days, it's usually easier to raise the inner pivot by moving it up to the next mounting hole in the shock tower. If your car uses vertical ball studs, raise them in 0.020-inch increments by placing shims under the outer ball studs. Even this small change will make a difference.

RAISE ROLL CENTER. Just reverse the steps used to lower roll center. You can raise the camber link's outboard pivot, or lower the inner pivot. Either option works equally well. If possible, make the adjustments in 0.020-inch increments, as even small changes can make a big difference. It's usually easiest to raise the outer link by placing shims under the ball stud (if it's mounted vertical).



Changing the roll center can be as easy as moving the ball stud on the rear hub to a higher or lower position.





Switching from small-diameter tires (above) to full-height foams (below) will alter roll center and make your car handle differently, even if you compensate by lowering it's ride height.

TIRE SIZE, RIDE HEIGHT AND ROLL CENTER

Tire diameter and ride-height adjustments also affect roll center. Installing larger-diameter tires is common in nitro racing when you have to run a long Main. In qualifying, you usually run the tires that have as low a profile as you can get away with for best handling. But in the Main, where you need to run at least 5 to 8 minutes on a set of tires, larger-diameter tires are needed, and the extra sidewall height raises the car's ride height. So, you lower the ride height to compensate for the increased tire diameter. When you lower the ride height, the arms become more deeply angled, and the roll center changes—it usually goes lower but may rise. It all depends on the relationship of the camber link and lower arm as set for the previous, smaller tires.

Even if you leave your ride-height setting alone, just switching to tires of a different diameter will alter roll center and affect handling. The moral? Be prepared. Test your car before race day so you'll know how your car's handling will change when you install your A-main rubber. And remember: as the tires wear during the race and become smaller in diameter, your car will regain the "small-tire" feel you're used to.

WHEN TO ADJUST ROLL CENTER

Roll center is a great tuning adjustment, but it shouldn't be the first adjustment you make, and it won't cure a bad setup. Adjust the roll center only when you feel your spring and damping settings are close. If your car spins out or pushes way too much, this isn't the time to look at the roll center. Roll-center adjustments are usually made when a small change is needed, or when you're at the upper range of other adjustments. Here's a typical scenario: your touring car handles very close to how you would like it to handle, but you'd like the rear of the car to stick a bit better in the turns, and you've already installed your softest rear tires. Now is the time to try a roll-center change. In this case, lowering roll center will help transfer more weight to the outside tire and give you more grip.

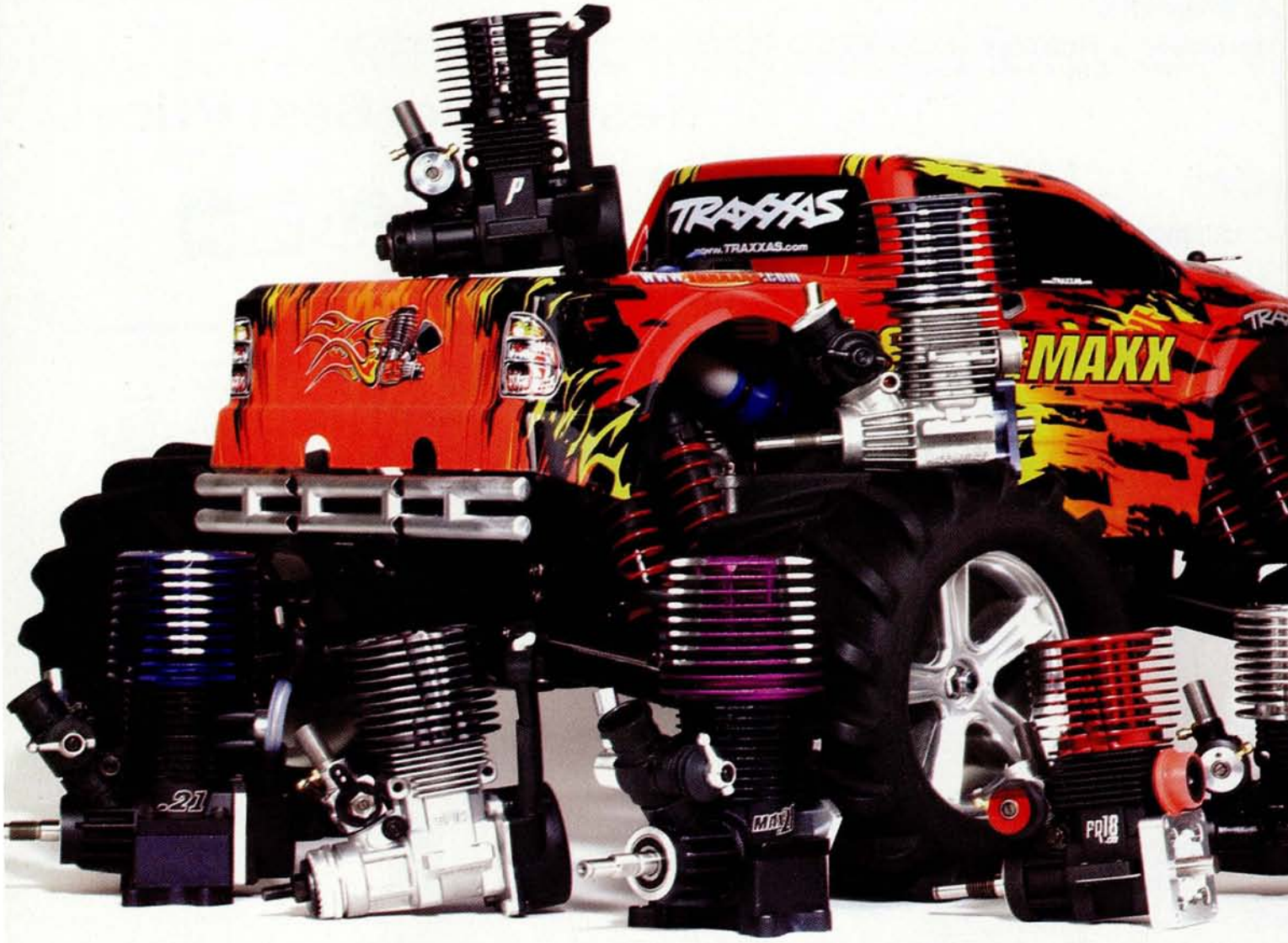
ROLL WITH IT

So that's roll center—or, at least, the short version. To make truly informed decisions, you must consider factors such as camber rise, roll-center migration, instantaneous center and a host of other factors. When tuning any race car, RC or full-scale, you'll find that everything affects everything. But don't worry: the key to lower lap times isn't found in memorizing minutiae but in experimentation and experience. Play with different roll-center settings when you practice. At first, make large adjustments so you can get a feel for how roll center affects your car's performance: then try smaller adjustments to fine-tune your favorite setups. The stopwatch will let you know what works, even if the feel at the wheel doesn't change dramatically. ■

maxx overdrive

YOUR TRAXXAS MAXX SOURCE

BY JOHN HOWELL



DROP-IN ENGINE GUIDE

The T-Maxx already includes one of the most powerful .15 engines available today (that would be the TRX 2.5), but that hasn't stopped the many aftermarket engine manufacturers of the RC world from offering a seemingly endless variety of engines designed expressly for the T-Maxx. Since the TRX 2.5 already wrings out all the horsepower .15ci of combusting nitro can offer, the only way to go for aftermarket engine makers is up—as in bigger displacement. Big-block conversion kits have been around since the original T-Maxx rolled out, but the trend now is drop-in installation. Forget the mods; these aftermarket mills can be bolted onto the stock T-Maxx chassis in a matter of minutes. For this edition of "Maxx Overdrive," I've collected the latest punched-out Maxx engines. Compare the specs, and then go big!

IF THE ENGINE FITS ...

The criteria for an engine's inclusion in this guide are simple: basically, each has to bolt in with minimum fuss. Engines that require major conversion kits or "fabricating" to get them to fit are not included in this guide. With enough money and a CNC machine, you could make a lawnmower engine fit your Maxx, but this guide includes only drop-in engines. Note that some engines fit only the current TRX 2.5 T-Maxx, while others only fit the original T-Maxx. The engines are listed in alphabetical order by brand, and prices vary with dealer.

EPIC BIG BORE .18

- Fits original T-Maxx (not the latest TRX 2.5 version)
- Good budget-price engine.
- Based on popular .12/.15 engine block.
- Aluminum carburetor body.

Item no. EP1800; $150

OFNA PICCO .21 SMALL-BLOCK

- Fits TRX 2.5 T-Maxx.
- .21 displacement in small-block case.
- Available in pull-start and non-pull-start configurations.
- Uses existing TRX 2.5 clutch, EZ-Start and exhaust.
- Picco-specific engine mounts included.

Item no. 51220 (pull-start); 51221 (non-pull-start); $220

FANTOM RACING FR18

- Fits TRX 2.5 T-Maxx.
- Traxxas EZ-Start can be bolted right on and uses existing Traxxas parts.
- Turbo-design, race-ported crankshaft uses stock clutch parts.
- Includes custom manifold, springs and manifold seal.

Item no. FAN01024; $150

PICCO P2 .21

- Fits TRX 2.5 T-Maxx.
- Comes with aluminum engine mounts.
- .21 displacement (2hp+).
- Accepts TRX 2.5 clutch, EZ-Start and exhaust.

Item no. WRXP2M21; $200

COMPARISON CHART

ENGINE	DISPLACEMENT	PORTS	HP*	RPM	CARB	BORE	STROKE	EXHAUST	EZ START	2.5 MAXX	PRICE
Epic Big Bore .18	.18ci	3	1.8	39,000	Rotary	16.4mm	14mm	Side	No	No	$150
Fantom Racing FR18	.18ci	3	1.95	41,250	Slide	16.4mm	14mm	Rear	Yes	Yes	$150
OFNA Picco .21 SB	.21ci	5	2.38	32,000	Slide	16.26mm	16.8mm	Rear	Yes	Yes	$220
Picco P2 .21	.21ci	5	2.38	32,000	Slide	16.26mm	16.8mm	Rear	Yes	Yes	$200
Peak Performance Diablo	.18ci	3	1.9	40,000	Slide	16.4mm	14mm	Side	No	No	$135
Sirio .18TX-PTR	.18ci	8	1.9	40,000	Rotary	16.4mm	14mm	Side	No	No	$200
Sirio TX-18	.18ci	8	1.9	40,000	Slide	16.4mm	14mm	Rear	Yes	Yes	$190
Team Orion Wasp .18	.18ci	3	1.9	40.000	Slide	16.4mm	14mm	Side	No	No	$100
Team Orion Wasp .21 SB	.21ci	5	2.38	32,000	Slide	16.26mm	16.8mm	Rear	Yes	Yes	$220

**Manufacturers' claimed horsepower*

PEAK PERFORMANCE DIABLO .18

- Fits TRX 2.5 T-Maxx.
- Comes with an oversized cooling head.
- Long-lasting ABC piston and sleeve construction.
- Comes with a precision slide carburetor.

Item no. PEK6060;
$135

TEAM ORION WASP .21 SMALL-BLOCK

- Fits TRX 2.5 T-Maxx.
- Comes with aluminum engine mounts.
- .21 displacement
- 2hp+.
- Uses existing Traxxas parts.

Item no. 80302;
$220

SIRIO .18TX-PTR

- Fits only the original T-Maxx.
- Has a rotary carb.
- Available only in a pull-start version.
- Threaded shaft accepts stock Traxxas clutch.

Item no. S18TXPTR;
$230

SIRIO TX-18

- Fits TRX 2.5 T-Maxx.
- Traxxas EZ-Start can be bolted right on.
- Has a big-bore carb and oversized cooling head.
- Comes with cool a carrying case.

Item no. STX-18;
$190

TEAM ORION WASP .18

- Fits only the original T-Maxx.
- Durable ABC construction.
- Light, double-bushing conrod.
- Least expensive engine in this group.

Item no. 80220;
$100

NEWS FLASH!

SLAYDEN SLAYS THE COMPETITION

Steve "Slaydaddy" Slayden recently TQ'ed and won the Unlimited Truck class at the big Houston Nitro Invitational with his Traxxas T-Maxx and then went on to do the same on the following weekend during the first round of the RC Pro Series Southern Division in Houston, TX. Slayden, a regular here in "Maxx Overdrive," faced tough competition that included plenty of very capable big-block trucks and truggys. Steve's truck was featured in the February installment of Maxx Overdrive. Congrats, Steve!

maxx mail

After reading your article on how to make the Traxxas SportMaxx into more of a 2WD stadium truck, I bought one. I read the part about keeping the single-speed tranny, but what should I do about gearing?
Danny Tyler, Fairmont, MN

Well, Dan, the answer to your question depends on a variety of things. If you plan to race, look at the track you'll be running on. Its size and features will help you determine whether you need to gear up (if it has really long straightaways) or gear down (if there are more tight, twisty sections). If you don't plan to hit the track and you're interested only in top speed, gear up a couple of teeth. Traxxas offers a variety of clutch bells from 16-tooth up to 22-tooth (in increments of 2 teeth). Traxxas also offers a 70-tooth spur that will allow you to fine-tune your gear ratio more precisely.

Thanks for writing, Dan; since you're so interested in making your SportMaxx even more "sporty," Traxxas has donated a 4mm, lightweight aluminum racing chassis to your cause (item no. 4922X).

SOURCES

EPIC, BY TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.

FANTOM RACING (269) 649-9583; fantom-motors.com.

OFNA RACING (949) 586-2910; ofna.com.

PEAK PERFORMANCE (714) 692-8533; peakmotors.com.

PICCO; distributed by Werks Racing (408) 365-1000.

SIRIO; distributed by Trinity Products Inc. (732) 635-1600; teamtrinity.com

TEAM ORION INC. (714) 694-2812; team-orion.com.

TRAXXAS CORP. (972) 265-8000; traxxas.com.

maxx talk! Send your "Maxx" questions and comments to maxxoverdrive@airage.com.

RC Solutions
Roll Cage Kits

RC Solutions' roll cages are available for the Traxxas Maxx series, Associated Monster GT and HPI Savage. The cages are bolted right onto the chassis to protect vital components from damage in harsh crashes. They are constructed of tough 6061-T6 3mm-thick aluminum, and the interlocking rails make a superstrong structure. The four roll cages each come in three anodized colors—red, blue and silver. The exception is the cage for the Savage, where red is substituted with purple.

I assembled and installed the roll cage for the T-Maxx on my stock truck in less than 20 minutes. The only difficult part is assembling the cage before you mount it. It takes some fiddling to lock the rails together, so be patient. Before I mounted on the roll cage, I threw it on a scale to see how much weight I was adding to my Maxx. It adds 10.6 ounces—but that's the price you pay for a truly protective roll cage. The assembled roll cage fit directly on the chassis without any modifications. The kit even includes a bracket for mounting the receptacle for the EZ-Start. The only stock part of your truck you'll have to modify is the body. RC Solutions designed the cages to fit most popular bodies including stock, but to fit over the rear rails of the roll cage, they need to be trimmed a little. When I had trimmed out some of the rear bed of my T-Maxx body, I found that the exposed cage gave my ride a cool "Mad Max" look.

The roll cage kits from RC Solutions are well made, easy to assemble and mount, and they will definitely protect your truck in those ugly landings. Yes, they add some weight, but the extra security they provide makes them a worthy addition.—*Paul Onorato*

RC Solutions Roll Cage Kits
Savage—038 (purple), 056 (blue), 037 (silver); $115.
E-Maxx—039 (red), 040 (blue), 012 (silver); $115.
T-Maxx—022 (red), 023 (blue), 011 (silver); $105.
Monster GT—045 (red), 046 (blue), 047 (silver); $136.
RC Solutions (480) 609-7233; rc-solutions.com.

A stock Traxxas T-Maxx with the roll cage installed. The roll cage is bolted directly onto the chassis without any modifications. Not only will this truck survive rough tumbles, but now it also has a cool "Mad Max" look.

Are these things tough? You bet. Here, our very own Kevin Hetmanski stands on top of a Traxxas T-Maxx fitted with the RC Solutions' roll cage.

The stock T-Maxx body still fits on the chassis, but part of the pickup bed must be cut out so that the rear of the roll cage can clear it. You must drill six small holes for the new body mounting locations—two on the hood, two on the roof and one on each side of the body.

HPI Savage

Traxxas T-Maxx

Team Associated Monster GT

Pro-Line Racing
40 Series Spinner Kit

Pro-Line's new 40 Series Spinner Kit lets you add that extra dub-spinning flair to its oversize Maxx wheels. Unfamiliar with the "spinner" craze? I'll explain. A spinner is a thin, freewheeling disc that's bolted to the outside of your wheel (usually to the end of the drive axle). It's made to emulate the wheel pattern, so your car looks as though it has a regular wheel bolted on. When you accelerate, the spinner stays put, and it looks as if the wheel isn't moving at all. When you brake, the freely rotating spinner makes it look as if the wheel is "spinning" while your car or truck is sitting still. So there you are—Spinner 101.

Pro-Line's new 40 Series Spinners are made from high-quality, 6061 aluminum and polished to a mirror-like shine. The spinners are supported by two bearings for more efficient spinning. To bolt the spinner on your 40 Series wheel, simply remove the wheel nut, bolt the extended spinner nut on the axle stub, then place the spinner on the nut. It's really that simple.

Although they spin very freely, the Pro-Line spinners don't work quite as effectively as the spinners on a full-size car. Blame it on physics, not Pro-Line; the spinners aren't heavy enough to provide the inertia that will prevent them from spinning under acceleration. They do spin more slowly than the accelerating wheel but not slow enough to create a spooky motionless effect. The spinners do live up to their name, however, when you stop after a run, giving your Maxx exactly the same eye-popping in-motion look that you've seen on dubbed-out Escalades.—*John Howell*

Pro-Line 40 Series Spinner kit—6026-00; $34/pair.
Pro-Line (909) 849-9781; pro-lineracing.com.

DuraTrax
Kwik Pit Nitro Belt Combo Pack

DuraTrax's Kwik Pit Nitro Belt Combo Pack is a versatile storage belt that comes with all the basic accessories needed to run nitro-powered vehicles. This utility belt has seven multisize pockets that securely hold the four included nitro accessories: a C-size alkaline glow starter, an extra-long engine-tuning screwdriver, a 4-way wrench and a 250cc fuel bottle. The spare pockets allow you to carry other tools you may require for racing; I found that the center pocket was a perfect place for my Traxxas EZ-Start. The durable-nylon belt can be adjusted to fit almost any waistline, and its quick-release buckle makes it easy to put on and take off. At first, I felt a bit silly with the belt around my waist, but I was quickly won over by the convenience of having all the necessary nitro tools within easy reach. It's the perfect gadget for pitting at a race.—*Nathan Miller*

DuraTrax Kwik Pit Nitro Belt Combo Pack—DTXP2035; $25.
DuraTrax; distributed by Great Planes; (217) 398-6300; (800) 682-8948; duratrax.com. ■

body shop

secrets from the paint booth

BY JOSH THIEL

Drawing the line

Everyone knows that you're supposed to paint between the lines, but the problem is there aren't any lines on bare Lexan shells; that's where your creativity comes in. Although painting lines might sound simple to do, you need to know a few tips and techniques to do it properly.

Sharp, clean lines are the hallmark of a well-painted body and can make the difference between a concours dazzler and just another paint job. Quite often, thin borders or pinstripes surround the major shapes of a design to add accent color and depth to a paint job. This month, I'll give you the skinny on adding fine lines to your next paint job.

Fine line details give this Trinity Reference Killer B shell a high-speed look.

Not only can you use fine-line plastic tape to paint clean lines and pinstripes, you can also use it to lay out a design.

GETTING STARTED

I'll explain the key features of each line-making method for you. I'm working with a body that has been washed and sprayed with three coats of liquid mask. All painting was done with an airbrush and Parma Faskolor paints. You'll probably notice that I incorporated several different techniques to add lines to the body; combining various methods can be an excellent way to create a desired effect.

Typically, I create all of my pinstripes by cutting the lines freehand into a masked-off body with a no. 11 hobby knife. Don't worry; if that sounds difficult, you can also use fine-line masking tape, which is marketed specifically for this purpose, and Pactra sells several different widths.

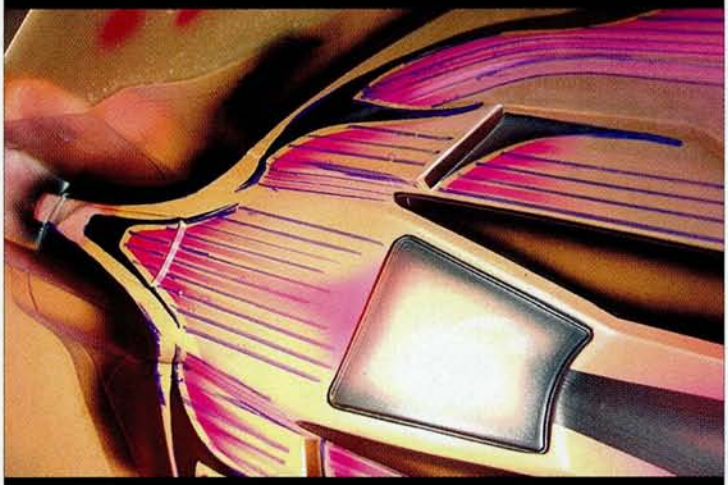
FREEHAND LINES

At first, cutting out freehand lines can be somewhat difficult, but it is the simplest method for creating thin lines, and once mastered, it also becomes the most versatile. Their quality is the direct result of how cleanly, evenly and straight you can pull the razor blade.

A well-laid-out design is key to creating well-cut lines Before you begin to paint, draw the design on the outside of the body with a permanent-ink marker; you can clean it off later with isopropyl alcohol, or if the body has an external protective overspray coating, the lines will come off with that. Very clean and evenly drawn lines on the outside will help you easily trace a design when you're cutting into the inside of the shell. Create a design with fine-line tape, and use it as a guide for drawing it on the shell. Just run your marker along the edge of the tape to guide you.

Above: to create super-precise guidelines, use a permanent marker to trace along tape that you've positioned on the body.

When you start cutting a design, carefully follow the lines that you have drawn. To paint a section of pinstripes first, you can trace a set line width that has already been drawn or use a previously cut parallel line as a reference. Look carefully for any cuts that you made, and follow them smoothly at the line width that you are trying to achieve, e.g., an ⅛-inch stripe. It is often very difficult to see these lines, so I tend to cut pinstripes against an already painted line to make the line that I'm following easier to identify.



Above: faded parallel lines were cut, painted and await a background color.

Ultimately, line quality depends on how smoothly you can cut a line. To help cut smooth lines, steady your hand by dragging your finger along a smooth portion of the body as you drag the knife, and whenever possible, pull the knife toward you; don't push it away.

Below: to steady your hand and cut smoother lines, drag your finger along the body as you cut.

DOUBLE BLADES

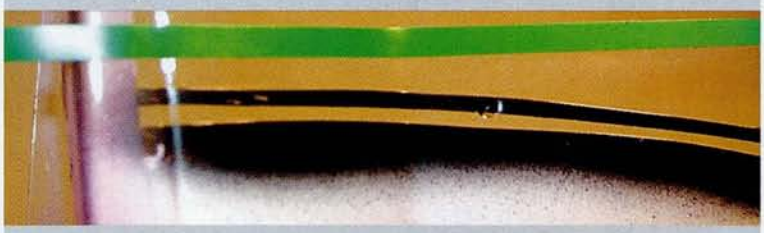
You can make perfectly straight and even lines by doubling the knife blade. Carefully place two no. 11 hobby blades into a knife handle and position a shim between the blades that spreads the tips into the line width that you'd like to cut. Don't try to do this with your fingers. Instead, use a small, flat-blade screwdriver to separate the blades. Then tighten down the blades; make sure that the tips are the same length and are parallel to each other. Wrap a piece of tape around the blades to keep the shim in place.

A doubled-up hobby blade can be used to cut perfectly spaced lines. Place a wedge between the blades, and you'll have perfectly uniform lines every time.

Because the blades are rigidly positioned, this technique is best for straight or gently curving lines. I used this method to cut the many straight parallel lines that I had incorporated into my design. I removed the alternating stripes and sprayed them with a violet fade; then I removed the background layer and sprayed it with a fluorescent pink and purple fade.

PLASTIC TAPE

Plastic fine-line tape is a sure-fire way to achieve uniform lines, however, it has some limitations in certain applications. The plastic tape that Pactra markets is made from a very thin material that makes it very flexible and good at making tight turns. The narrower the tape you use, the tighter the curve that can be created. Make sure that the tape sticks properly to the compound curves of a body. Also, any time you use tape, you must burnish its edges (by rubbing the edges down with your fingernail or a credit card) to prevent bleeding, and the paint should be applied in light coats.



When you use fine-line tape, paint the background colors first and the stripe last (it is generally best to apply the tape first). If you want a bordering stripe, mask off neighboring sections of color by overlapping additional masking tape on to the tape and paint the surrounding background sections one at a time. Then remove the additional masking tape and paint the stripe. If this isn't practical, use the tape to just barely overlap a painted edge, paint the next background color, and then remove and paint the stripe. To create a double pinstripe, just apply a line of tape along, but offset it from, a painted edge or another tape edge.

Tape is also excellent for making multiple faded lines similar to those I made using the double-blade technique. First, position the tape in parallel lines (paint the background beforehand). Next, remove the tape and paint in a gentle fade along the leading edges, but leave an unpainted end. To finish the effect, fill in the unpainted area with the original background color.

To paint these black-over-white faded lines using plastic tape, first paint the main background color, then remove and paint a fade into the lines. Finish by filling in the lines with the original background color.

This is the top of the buggy's wing. All of the black stripes you see were cut with the aid of plastic tape.

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9174 Kit	$59.95	$39.95
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bodyshop

I hope this helps you to follow the straight and narrow—at least when it comes to painting. Regardless of the methods you use, always choose your design ahead of time and develop a plan to achieve it; you'll be sure to create a sweet-looking body. Keep the paint flowing!

new in the SHOP

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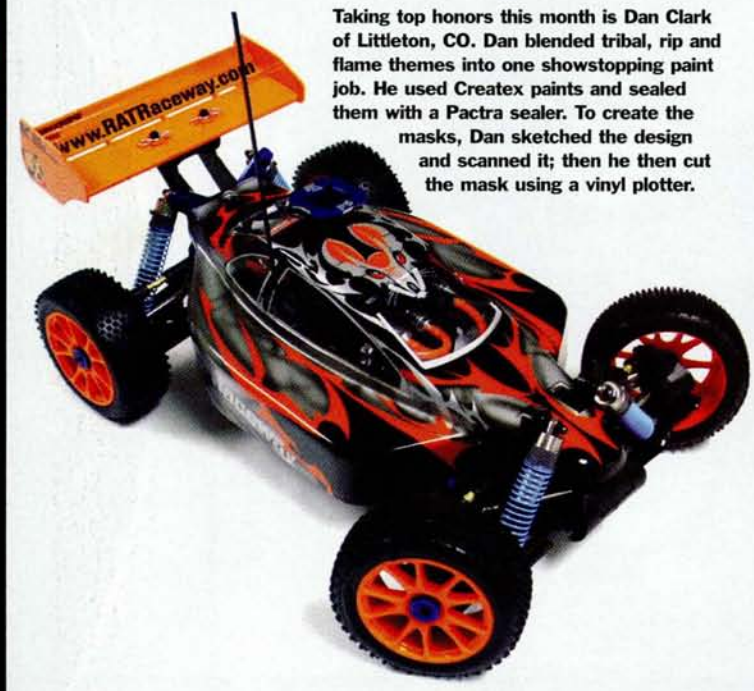
Excel Hobby Blade Corp.
(973) 278-4000; exceltools.net.

in the zone

Each month, *RC Car Action's* super online resource, "Radio Control Zone," hosts an online painting contest. The winner gets to show off in "Body Shop." Click over to radocontrol zone.com for the submission rules. Maybe we'll see your work here!



Taking top honors this month is Dan Clark of Littleton, CO. Dan blended tribal, rip and flame themes into one showstopping paint job. He used Createx paints and sealed them with a Pactra sealer. To create the masks, Dan sketched the design and scanned it; then he then cut the mask using a vinyl plotter.

SOURCES

PACTRA INC. distributed by Testor Corp. (815) 962-6654; testors.com.

PARMA/PSE (440) 237-8650; parmapse.com.

TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.

DETAILING **DILEMMA?** Send your Body Shop questions and comments to Josh Thiel at bodyshop@airage.com.

piston power

expert engine advice

BY STEVE POND

Coming Out of the Cold

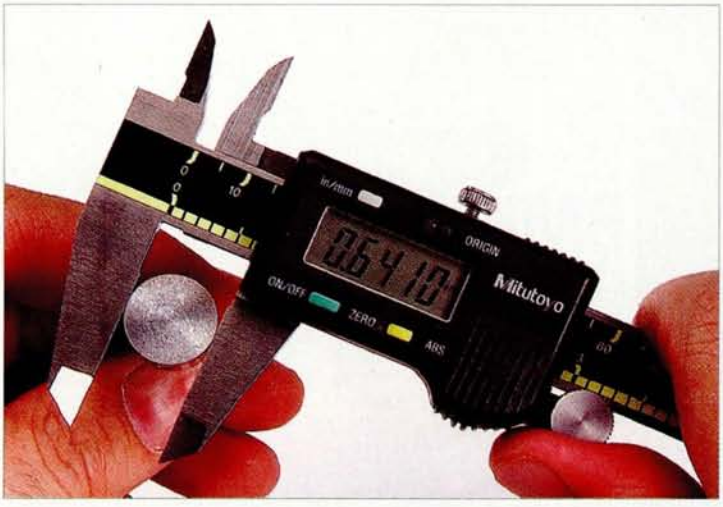
The cold temperatures of this past winter kept most of us nitro nuts indoors, but the temptation to burn some fuel is often too much for some—especially those with new cars and trucks. It's one thing for us to brave the cold, but it's another story for your nitro engine. If you're among those who couldn't wait for warmer weather, you already know that running a nitro engine in frigid weather introduces a few extra challenges. What you may not know, however, is that very low temps can accelerate wear inside the engine, and it won't be evident until the weather starts to warm up.

COMFORT ZONE

Nitro engines are built to run well at certain ambient temperatures. The piston-sleeve taper, the size and number of cooling-head fins, the amount of compression, the recommended percentage of nitro in the fuel and other factors are usually optimized for running at somewhere between 70 and 90 degrees F. That isn't to say that they can't run well in most conditions, but they do run best within a specific temperature range. The engine isn't able to adapt to winter's low temps because, unlike a full-scale engine, it doesn't have a thermostat, so its temperature drop may be excessive. How you treat your engine under these conditions will affect its future performance, especially as more moderate temperatures return.

COLD AND CALCULATING

The piston sleeve (cylinder) is tapered at the top to compensate for the increase in temperature near the cylinder head when the engine is running. When it reaches running temperature, the heat expands the sleeve so much that it's almost straight; this means a really tight piston/sleeve fit, and that means good compression and combustion. If the sleeve were straight to start with, the heat at the top of the sleeve would cause it to expand, and the desirable snug piston/sleeve fit would be lost. A lot of the



The high-silicon aluminum used for the piston in RC nitro engines doesn't expand as much as a brass piston sleeve or an aluminum engine block. As a result, the fit between the piston and sleeve is very tight until the engine reaches its full running temperature.

pressure that should be trapped above the piston to make power would leak past it and reduce engine power.

When we run our engines in very cold weather, the sleeve never gets hot enough to expand properly, so the piston is larger than the sleeve's bore; this results in an "interference fit." The sleeve hasn't expanded enough for the piston, and when the engine is running, the piston gets stuck in the top of the sleeve every time it reaches the top of its stroke; this causes the piston to wear excessively. Only when the piston has worn enough to match the cold sleeve will the engine run properly.

Warmer weather means higher engine operating temperatures; the sleeve expands to its intended size, but the piston has been worn down, and compression is poor because air leaks past it. This means that your engine no longer runs consistently and at max power.

GLOOMY FORECAST FOR YOUR ENGINE?

If your engine has been exposed to too much cold-weather running, expect these problems: it will be hard to start; it won't idle smoothly, especially when it's hot; and it will often stall when its speed gets close to idle.

THE FIX

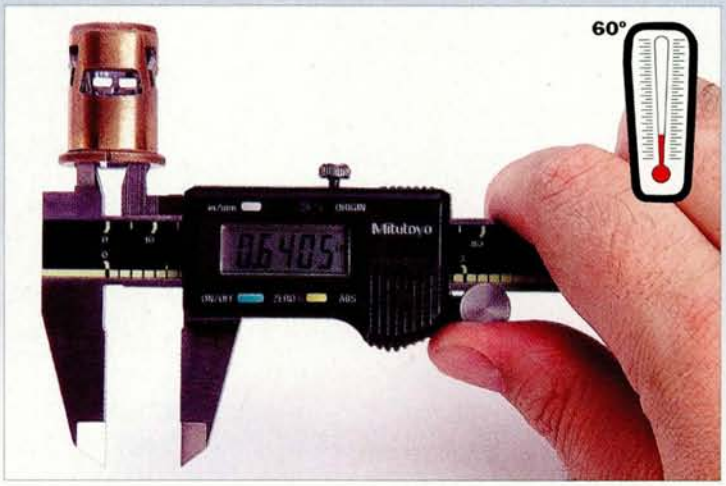
The solution isn't popular. You can't snap your fingers and restore a worn piston and sleeve. Just take your licks and buy new ones. Save the old ones for next winter, but to bring your engine back up to spec for the summer, you'll have to splurge on new parts.

You could milk a little more life out of your engine by having the sleeve resized by John at OS Rocket. He offers a special process (popularly called "squeezing") with which he breathes new life into engines. This high-tech process has nothing to do with crushing your sleeve in a vise, so please don't attempt to do this yourself. You can contact OS Rocket at OS Rocket@neo.rr.com.

AVOID COLD-WEATHER RUNNING

To be completely safe, wait for the warm, sunny days (which should be upon us by the time you read this) when the temp climbs to more than 60 degrees F. And before next winter, be sure to learn a few ways to protect your engine.

For now, enjoy the summer. ■



Measuring the inside diameter of the cold piston sleeve shows that it's just a hair smaller than the piston's diameter.

Preheating the sleeve to typical running temps shows relatively significant heat expansion that creates enough clearance for the piston. This clearly illustrates how running your engine in cold weather will prevent the full expansion of all the engine components, and that will accelerate wear and lead to poor warm-weather performance.

TECH Q&A

The turbo plug on the left provides a slight power boost.

? What's the story with turbo glow plugs? Do they really increase performance? I see a lot about turbo engines with special crankshafts and extra ports. Are these part of what makes a "turbo" engine, and if they are, what do they do? A friend and I have been bashing with nitro touring cars in parking lots for a while now, but I'd like to start racing at the local track. I want an engine that's powerful enough to compete with, but it must be race-legal; most of all, it must be controllable and reliable. During my hunt for a new engine, I ran into a few that use these turbo plugs; are they hype or not? Brian V. [email]

A There isn't really a class of "turbo" engines that share a universal set of features; the word is mostly used to describe certain engine components. "Turbo" crankshafts typically have more aggressive porting at the exit of the crank's center port. It bears no relation to an actual turbine, and though this type of crankshaft is more effective, the word "turbo" is more useful for marketing than to accurately describe of the crank's function.

The same goes for a "turbo" glow plug; it's just a word that "stuck." When this new type of plug was introduced, the word distinguished it from a standard plug. A turbo plug's tip is smaller than a standard plug's, and it transitions more smoothly into the combustion chamber's interior. This has a very minor effect total power output, but it does increase it. The increase is lost on all but the most experienced racers and engine tuners, so I wouldn't go out of your way to find one, but I also wouldn't avoid them either. The turbo plugs are a little more expensive and may be harder to find than standard plugs, but as long as your local track or shop has a regular supply, you should be in good shape. They're now ROAR-legal for all classes, so most tracks probably allow them, but before you make your investment, be sure to check with your local track to make sure that engines with turbo plugs are allowed there.

POWER PROBLEMS? Send your Piston Power questions and comments to Steve Pond at stevep@airage.com

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Instruction deconstruction

I love owners' manuals. They're like storyboards for the building session to come; a chance to get a little wrench-turning buzz before I'm finally able to get some free time and tear into the kit. I've amassed quite a collection over the years, and I thought it would be fun to share some thoughts ....

RC POETRY

Japanese manufacturers' manuals are my favorite; there's always a glimpse of Japan's rich culture hidden amongst the hardware legends and parts diagrams. For example, if you could read the original Japanese captions for each of these illustrations, you'll find that each is actually a delicate haiku. Check it out.

1
Little brother swallows motor screw
No need for emergency room
He'll poop it out later

2
Stepfather buys RC kit to make nice
Then drives stepson crazy with advice
"You're not the boss of me"

3
Open window, smiling sun
Fumes escape past curtain
So you don't get a huge headache

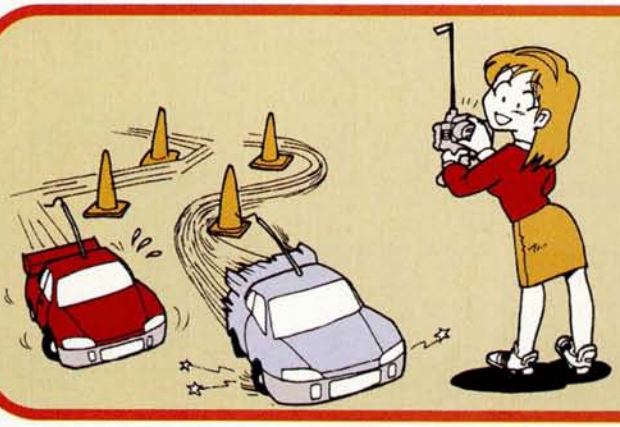
SYMBOLS I WOULD LIKE TO SEE

Graphic designers are incredibly clever these days, and it's amazing how much can be conveyed with simple icons. Although the symbols for "glue here," "check for free movement," "apply grease," etc. are helpful, there are still some symbols that aren't yet part of instruction manuals—but should be. For example:

▲ **Do not wear your good pants.** *(This graphic should accompany any steps that involve filling diffs or shocks.)*

▲ **You will drop this part and spend the next half an hour looking for it.**

◀ **This step is incredibly frustrating.**



Most manuals have cartoon dudes to guide you through the manual. KO Propo has the right idea—use a hot girl instead!

BACKLOT CONTEST

Here's one of my favorite illustrations: two guys making sure they don't have a frequency conflict. This picture is just begging for something funnier in those word balloons, so let's see what you've got. Email your best stuff to backlot@airage.com (or snail-mail to the address at the top of the page). Someone will win some kind of prize! ■